

THE BRICKVILDER

VOLUME XXIII

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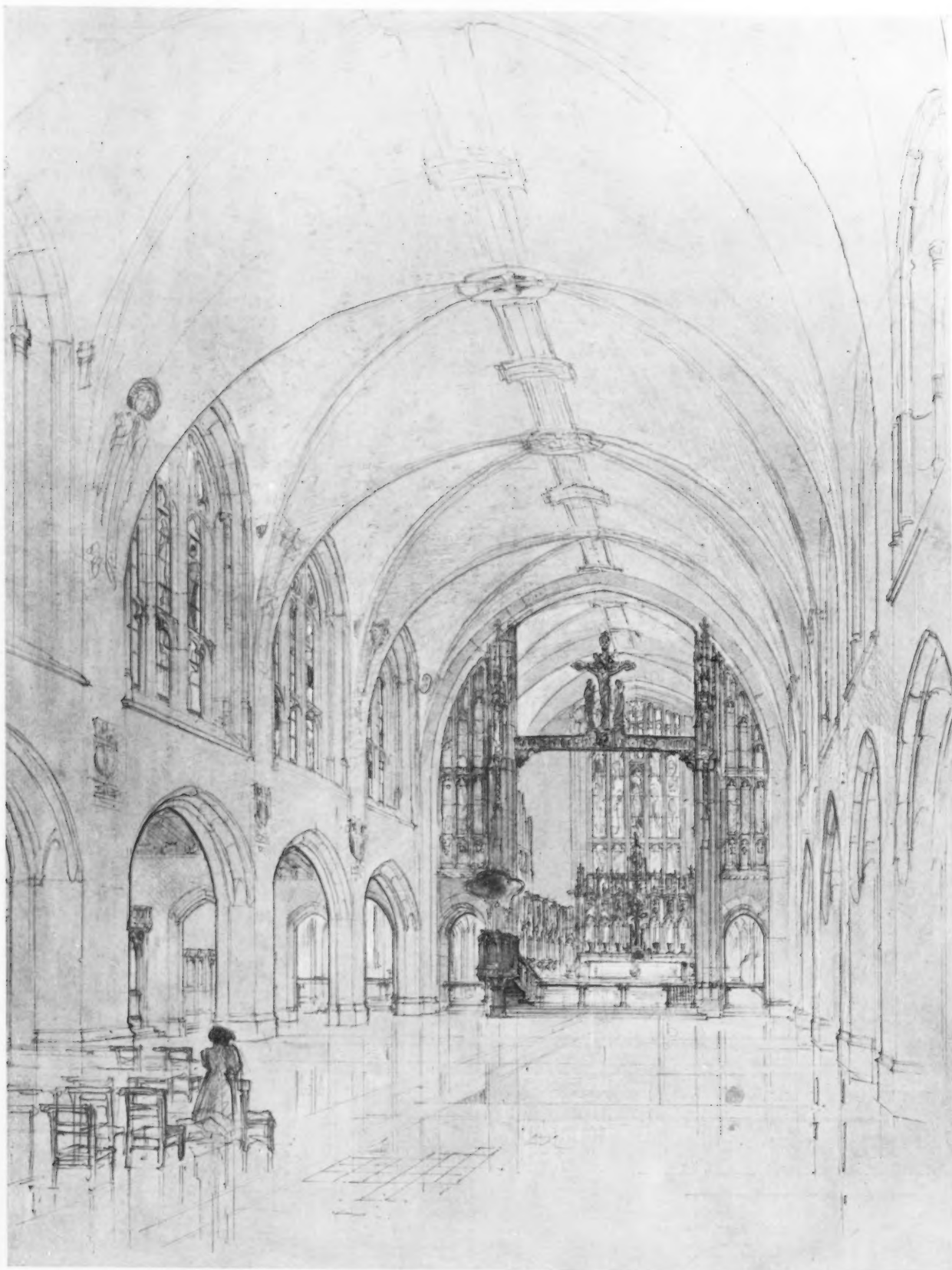
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SKETCH OF INTERIOR OF ST. CECILIA'S CHURCH, ENGLEWOOD, N.J.

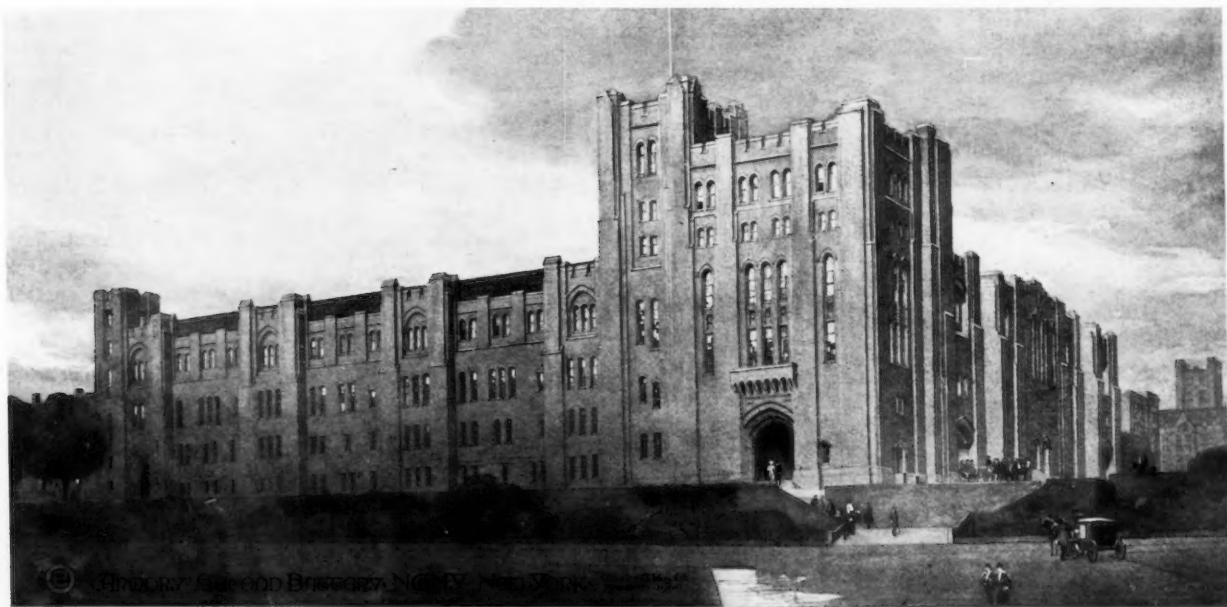
AYMAR EMBURY II AND ALFRED M. GITHENS, ASSOCIATED ARCHITECTS
ALFRED M. GITHENS, DELINEATOR

THE BRICKBUILDER

VOLUME XXIII

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Monographs on Architectural Renderers.

BEING A SERIES OF ARTICLES ON THE ARCHITECTURAL RENDERERS OF TO-DAY, ACCOMPANIED BY CHARACTERISTIC EXAMPLES OF THEIR WORK.

II. THE WORK OF ALFRED MORTON GITHENS.

MR. GITHENS as an architectural renderer is not as well known as Mr. Eggers, the first in this series, not because his work is of unequal quality, but because most of it has been rendering of buildings in the Gothic style, and his method is one which does not suggest his actual ability to render buildings of other types. Besides this his work for his brother architects is necessarily somewhat limited by the fact that he has been for some years in partnership with Mr. Charles C. Haight (the firm name is Charles C. Haight and Githens), and has had during that time a very considerable share in the design and construction of the numerous buildings at Yale for which this firm were the architects, as well as the other large work that they have executed.

Mr. Githens was born in Philadelphia in 1876, studied at the University of Pennsylvania, and afterwards won the Stewardson Traveling Scholarship; he is a former student of the École des Beaux Arts, which school has however not impressed its methods upon either his rendering or design, although he was enabled to get the real good of the Beaux Arts training in plan and its general broadening influence. As a draftsman he was at different times connected with several offices, but those in which his particular ability showed most clearly, and with which he was connected for the longest times, were Cope and Stewardson and Charles C. Haight, both of

which were eminent for their work in the Gothic style.

The first renderings by Mr. Githens which the writer ever saw were those made in Cope and Stewardson's office for some of the buildings at the University of Pennsylvania and at Princeton. These renderings showed the same characteristics that his work to-day possesses; they were notable for sharp accents on the salient features, and for a sort of glossing over of the parts which he found uninteresting. His palette is unusual; cold in the extreme and keyed with color combinations which, brilliant in themselves, do not convey to the eye any surcharge of color. His work is never suave or calm; one feels always that the day is cloudy, and that there is wind in the air. He is not a maker of lovely color schemes which dress up the poorest architecture into a semblance of decency, but is the instinctive architect seizing eagerly, almost fiercely, upon those things which he finds good, forcing them on your attention with a few heavy and yet delicious pen strokes, and running flat toned washes over the parts in which he is not especially interested; but by some instinct not easily understood he manages, perhaps unconsciously, to so place his accents that he has in the end not a series of spots but a picture, and always an architectural picture. This is Githens at his best, and working in the way most natural with him; thus he has worked in the perspective of the Yale Library and in that of the church interior.

His method in rendering differs very widely from that of most draughtsmen, especially in the one respect that the pencil drawing with which he starts is not regarded as a guide and a thing to be covered up; he makes the pencil lines themselves count in the rendering, washing in flat surfaces with water color, sometimes using it for his shadows, but more often indicating them with a fountain pen. Any one who has ever tried to use ordinary ink in connection with a water color knows how it tends to spread and blur; when Githens uses it he seems to forecast in advance the precise direction of these spots, so that they too fit into the picture. Chinese white is said in the schools to be a dangerous thing to use, but all our architectural renderers employ it largely, and none perhaps with more skill than Githens, though he rarely mixes it in his water color tones, but uses it for accents and high spots. He is of all the men the writer has observed in the actual process of their work the least careful as to his material; any color or any sort of paper is good enough; it may or may not be mounted, and if the water is dirty he changes his color scheme rather than get fresh water; it is essentially the method of a hurried man whose renderings are made for a purpose and not for his own satisfaction as pictures.

From this typical method of course, like all other men with original bent of mind, he has varied, experimenting with different methods, but never in quite the way one would expect. Thus, for example, the



House at Englewood, N. J. Aymar Embury II, Architect.
Alfred M. Githens, Delineator.



Church of The Holy Comforter, Charlotte, N. C. Charles C. Haight, Architect.
Alfred M. Githens, Delineator.

perspectives, although lifted from the generality by the sureness of its execution, and by the precision with which the architecture, and not the unimportant, although interesting entourage, is made the focal point.

The drawing of the church interior (see Frontispiece), as well as being one of the most amusing drawings that Mr. Githens has ever made, is perhaps as excellent a piece of design of church interiors as we have often seen. It is of course reminiscent of very many Gothic churches, but is by no means archeological, and the treatment of the choir with a sort of masonry rood screen with openings to an ambulatory is certainly very unusual. It might be

rendering of the Armory for the Second Battery, N. G. N. Y., looks in a general way like a sepia drawing, but is in fact largely a pencil drawing with a few flat washes, and this particular one is different from most of his drawings in that the building is treated with about the same tonal relations on all its parts and without marked accent. The suggestion of texture obtained by the use of the pencil is extraordinary and the ease with which light has been indicated by picking out the sides of the buttresses with a rubber, and by Chinese white in the sky, is extremely interesting. The bird's eye view of the Stevens Institute of Technology is another drawing quite different from most of his, and is of all his pen drawings perhaps more like the common run of



Competition Drawing for the Yale Memorial Library, New Haven, Conn.
Alfred M. Githens, Delineator.

Charles C. Haight, Architect.

said that this drawing was made by Githens in about two hours, and without anything except the roughest sort of cross and longitudinal sections to guide him and is therefore an excellent illustration of the precision and architectural knowledge with which he works. This is one of those drawings in which no line is wasted and every single thing which is put on the paper was made to count: the paper itself was gray tinted so that a solidity could be obtained by the use of a very few lines in a way impossible on white paper. The drawing is in a sense extremely tricky, certain things are very far from appearing as they would in an actual structure (as for example the silhouetting of the arcades between the nave and the side aisle at the left), but these have been made to count in a way that is more real than reality; and the manner in which the drawing progresses in strength of indication until at the choir screen the interest is brought to a focal point gives an impression of reality which is absent in even the best of photographs. The simple trick of reflections on the pavement relieves the floor from being a plain, bare, open space, without the trouble of drawing in miles of pews or chairs which would in a drawing distract the eye, as in reality they never would. Of color there is very little, the intersecting arches are brightened with Chinese white in such a way as to develop their form without the use of elaborate indication of vaulting, etc. There is a hint of color in the windows, also in the crucifix and pulpit, but the color is suggestive and not forced. It is a drawing which

deserves far more study than many drawings of infinitely elaborate character by the man who is interested in the methods of rendering, since it is a very impressive piece of work although a very quick one.

The drawing of the Church of the Holy Comforter is not dissimilar in its methods, although the most part of the rendering was done with pen and brown ink instead of pencil, and slightly more elaboration was used in the indication of trees and the entourage generally than was necessary in any part of the drawing of the interior. It is a drawing neither very good nor very bad, but selected because of the facility with which it was done and because of its general excellence of quality.

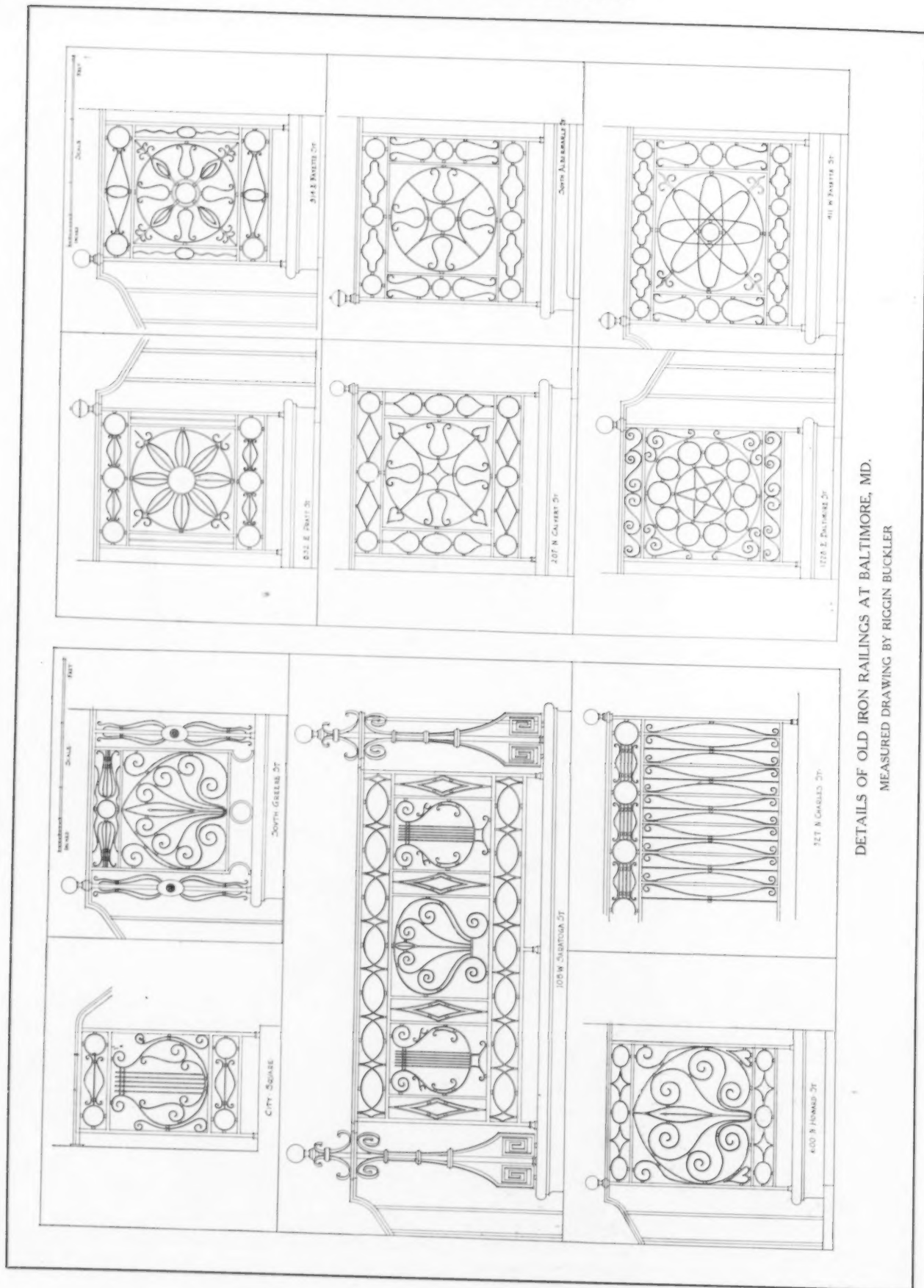
The drawing of the house at Englewood is carried to about the same distance, but there is a little more water color in this than in most of Mr. Githens' drawings. The background of trees as well as the foreground and terrace was done entirely in water color and the big trees across the front, indicated in pencil, are washed in with color. The building itself has most of the pencil perspective made by the architect untouched, and only certain things like the shadows in the windows, under the cornice and portions of the trellis are picked out in brown ink. The bright side of the building is washed in with Chinese white and the color of the tinted paper serves as shadows.

The illustrations together with these descriptions of his methods should indicate pretty completely the wide variety of Mr. Githens' ability as an architectural renderer.



Bird's Eye View, Stevens Institute of Technology, Hoboken, N. J.
Ludlow & Peabody, Architects.

Alfred M. Githens, Delineator.



Old Iron Work of Baltimore, Md.

ACCOMPANIED BY MEASURED DRAWINGS
OF SELECTED EXAMPLES OF WROUGHT IRON RAILINGS.

By RIGGIN BUCKLER.

THE possession of richly wrought ironwork was much sought after in some of our older cities at the time when our forefathers were creating the architecture of the Colonies. Baltimore has its share of examples which have survived, notwithstanding the ravages of time and the havoc of changing fashions. While the ironwork of Baltimore cannot be considered as beautiful or as varied as that which one finds in Charleston, nevertheless the visitor is well repaid for a trip through certain parts of the city.

Unlike most southern cities Baltimore is not a city of gardens, the houses being built directly on the building line, and therefore there is not to be found the wrought iron entrance gates and lamps that are so characteristic of the South. The ironwork, except for shutter fasteners, foot scrapers, and similar examples of the craftsmen's art, is limited to the ornamental landing panels that flank both sides of the broad marble step platforms.

There is not much doubt but that the work illustrated herewith was either designed or executed by the same person; the same motive in the center of the panel appears



Entrance to 105 West Mulberry Street.



Entrance on East Mulberry Street.

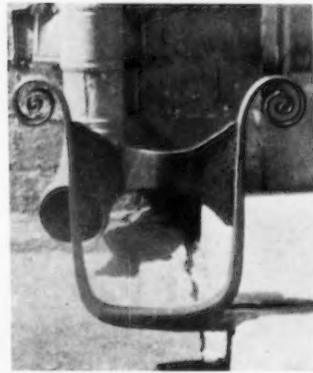


Shutter Fastener.

again and again with variations in the small side panels. The designs may be roughly divided into three groups: that with the lyre baluster in the center; that with the "honey-suckle" ornament in the center, and that with various combinations of geometrical designs. The scale of the ironwork is very delicate; the ornamental iron ranging from $\frac{3}{16}$ to $\frac{1}{4}$ inch in thickness by not more than $\frac{7}{8}$ inch in width, and the frames from $\frac{5}{8}$ to $\frac{3}{4}$ inch square.

In days gone by, when the residential center was on Franklin street and lower St. Paul, the average Baltimorean spent the greater part of the summer in the city; a month in the country or a visit to the Virginia Springs was considered an ample vacation. So when the nights grew warm, chairs and cushions would be placed on the front steps, and the platforms with their broad marble steps reaching out hospitably became the summer drawing room. To-day these same steps, forgotten and neglected, with the iron rust staining the marble, have become the entrances to tenements or, at the best, office buildings.

Wrought ironwork is again



Foot Scraper.

becoming much more appreciated by owners and the public generally. There is a demand for old ironwork which inevitably accompanies appreciation. It is to be remarked, however, that when severed from its original surroundings and associations, the older specimens of the craft of the blacksmith hardly appear to have much real sentiment apart from the beauty of the design. The new work of to-day compares favorably with that which was done a century ago, and few experts can distinguish between old and modern.

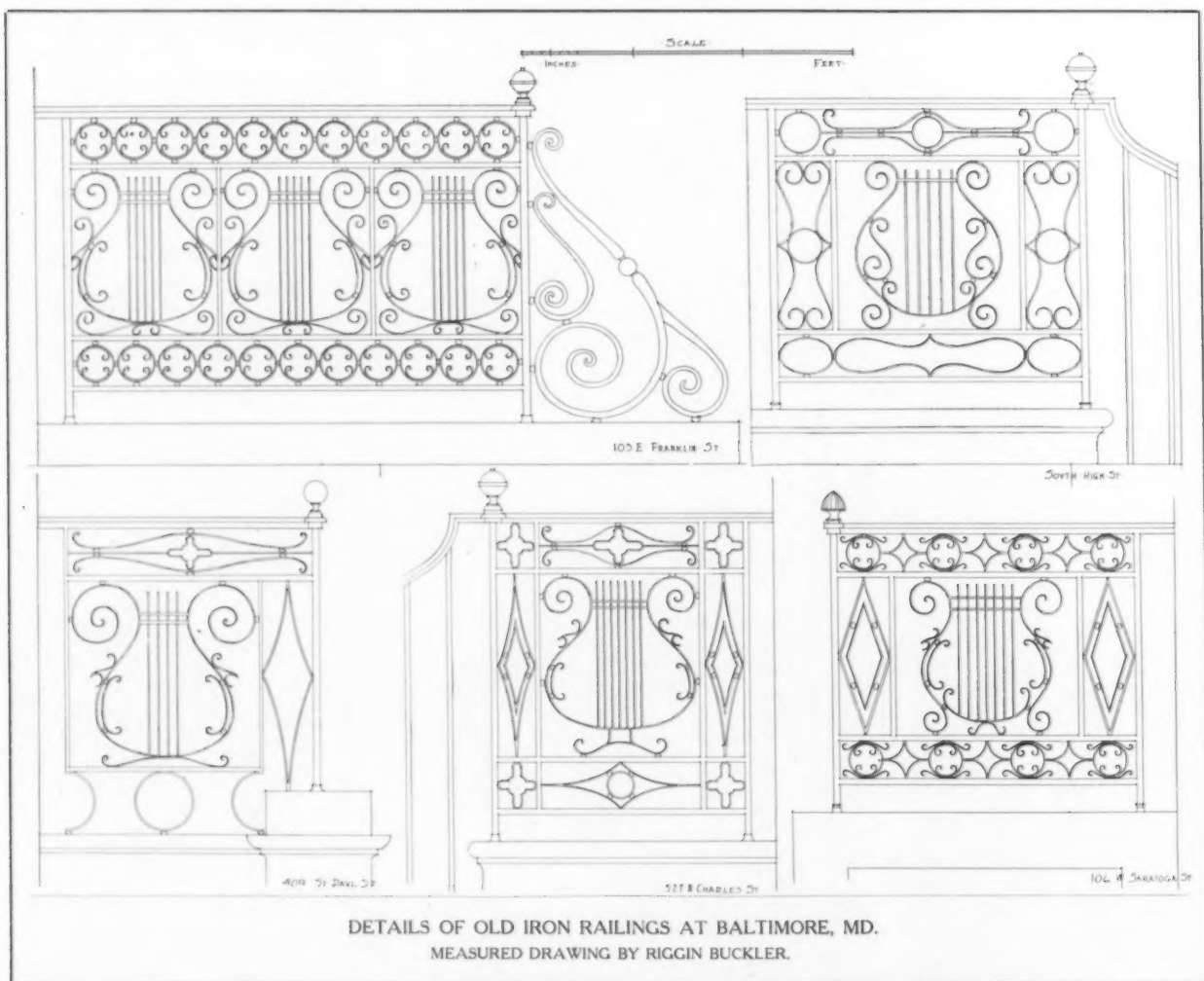
There is a strong appeal to the artistic sense about the craftsmanship of the worker in wrought iron. This is accounted for, perhaps, because



Entrance on East Pratt Street.

of one of the salient characteristics of the work. His operation must, by the very nature of his material, be hurried. He must strike while the iron is hot, while the sparks fly, and working under such conditions the result cannot fail to be more or less a work begetting a spirit of sturdy independence.

In the past the designing of ironwork was as essential a part of the smith's occupation as working the metal. Of the design the architect did not then concern himself. To-day, however, he considers all elements of design, and in wrought iron, working upon and improving the old forms, he has made progress equal to that evident in greater problems of modern architecture.



Heating and Ventilating.

I. OFFICE DATA FOR THE ARCHITECT.

By CHARLES L. HUBBARD.

IT IS intended to give in condensed form data relating to heating and ventilation prepared especially for the use of the architect. Work of this kind, as carried on in architects' offices, usually varies somewhat from that of the heating engineer, in that the architect deals more with quantities or capacity of apparatus than with details of construction. For example, proposals for a certain piece of work are submitted by a number of heating contractors, each furnishing his own plans and specifications. As these will vary more or less the architect must necessarily check up the various quantities and capacities, such as radiator and pipe sizes, boiler power, etc., before awarding the contract. Again, he wishes to prepare a uniform set of conditions for heating contractors to bid upon without going to the expense of preparing or having prepared a complete set of working drawings and specifications.

The following data are intended for work of this kind, and should enable the architect to quickly check the work of others or make the more important computations for a heating and ventilating layout with a minimum of reading and study.

Radiation. The following curves and figures apply either to ordinary wooden construction or 12-inch brick walls with lath and plaster inside. It is assumed that the workmanship is first class, the exposure south, and that an even temperature of 70 degrees is to be maintained within the building in zero weather.

The curves in Fig. I are for direct steam radiation, the upper one gives the square feet of radiating surface for the wall exposure and the lower one for the glass exposure.

Example (1). A room has 600 square feet of wall surface and 100 of glass; how many square feet of radiation are required? Referring to Fig. I, the upper curve calls for 52 feet and the lower 32, making a total of $52 + 32 = 84$ square feet of radiation.

Factors for Correction. When the building construction is not of the best, or the room has other than a southerly exposure, or there is a cold attic above or unheated basement below, the radiation must be increased accordingly by use of the factors given below:

Best Construction.....	× 1.0
Good Construction.....	× 1.1
Fair Construction.....	× 1.2
Poor Construction.....	× 1.3
North Exposure.....	× 1.3
East Exposure.....	× 1.15
South Exposure.....	× 1.0
West Exposure.....	× 1.2
Cold Attic.....	× 1.10
Cold Basement.....	× 1.10

Example (2). If the room taken in example (1) were in a house of fair construction, had a northerly exposure, and a cold attic above, what amount of radiation would be required?

The correction factor in this case is $1.2 \times 1.3 \times 1.1 = 1.7$, calling for $84 \times 1.7 = 143$ square feet of radiation.

The curves shown in Fig. II apply in a similar manner to direct hot-water heating.

Indirect Radiation. In the case of dwelling houses and similar work, the simplest way of determining the indirect surface for warming a given room is to first compute the direct surface and multiply by 1.5.

This method is very convenient, as a building employing indirect heat commonly has a considerable amount of direct radiation also, hence, in making the computations, the whole system may be worked out on the basis of direct heat, and then the surface, in such rooms as are to be heated with indirect, may be multiplied by 1.5. The same relation between direct and indirect surface holds in the case of hot water as well as for steam.

Pipe Sizes for Steam. The pipe sizes in steam heating are usually based on the allowable drop in pressure between the boiler and the last radiator at the extreme end of the line. In buildings of ordinary size a drop of one-fourth pound in 150 feet will be safe for all ordinary conditions.

Table I has been computed on this basis and is to be used for all horizontal supply mains and branches, and for risers where the two-pipe system is employed.

TABLE I (STEAM).

Square Feet of Direct Radiation.	Size of Supply Pipe.	Size of Dry Return.	Size of Wet Return.
70	1"	1"	$\frac{3}{4}$ "
120	$1\frac{1}{4}$ "	1"	1"
210	$1\frac{1}{2}$ "	$1\frac{1}{4}$ "	1"
430	2"	$1\frac{1}{2}$ "	$1\frac{1}{4}$ "
800	$2\frac{1}{2}$ "	2"	$1\frac{1}{2}$ "
1,300	3"	$2\frac{1}{2}$ "	2"
2,000	$3\frac{1}{2}$ "	$2\frac{1}{2}$ "	2"
2,800	4"	3"	$2\frac{1}{2}$ "
5,000	5"	3"	$2\frac{1}{2}$ "
7,500	6"	$3\frac{1}{2}$ "	3"
11,000	7"	$3\frac{1}{2}$ "	3"

It will be noted that the "dry" or overhead returns are made a size larger than when they are sealed or below the water line of the boiler. This is because in the first case they contain both water and steam, and "water hammer" and surging are likely to occur if the pipes are not of good size and properly graded. Pipes of this kind should pitch

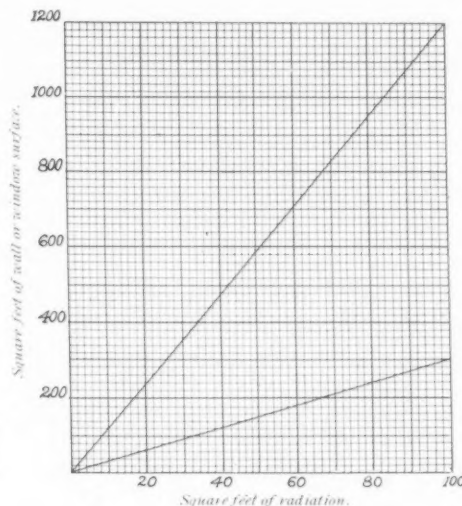


Fig. I. For Direct Steam Radiation.

Upper Curve for wall.
Lower curve for glass.

at least 1 inch in 10 feet toward the boiler. When the returns are sealed, no pitch is necessary, although it is customary to give them a slight downward grade toward the draw-off cock for purposes of drainage.

When the single-pipe system is employed, that is, where the steam supply and return water flow through the same riser in opposite directions, larger sizes must be used than given in Table I. In cases of this kind Table II may be employed.

TABLE II (STEAM).

Square Feet of Radiation.	Size of Riser.	Square Feet of Radiation.	Size of Riser.
40	1"	240	2½"
70	1¼"	300	3"
100	1½"	500	3½"
160	2"		

When the circuit system of piping is employed, that is, where a main of uniform size is carried around the entire building and connects with both the supplies and returns from the radiators, the following sizes may be used:

TABLE III (STEAM).

Square Feet of Radiation.	Size of Main.	Square Feet of Radiation.	Size of Main.
200	2"	1,200	4"
350	2½"	2,000	5"
600	3"	3,000	6"
900	3½"		

For indirect radiation, count each square foot of heating surface as two of direct and use Table I.

Pipe Sizes for Hot Water. The pipe sizes for hot-water heating depend upon the difference in temperature between the supply and return and upon the elevation of the radiator above the boiler. The frictional resistance due to the length of run is also an important factor.

For the average conditions of gravity heating, where the farthest radiator is not more than 150 feet from the boiler, the following sizes may be used for the supply and return mains and branches:

TABLE IV (HOT WATER).

Square Feet of Radiation.	Size of Supply and Return.	Square Feet of Radiation.	Size of Supply and Return.
20	1"	600	3½"
50	1¼"	850	4"
75	1½"	1,200	5"
150	2"	1,600	6"
250	2½"	2,000	7"
400	3"		

The vertical supply and return risers leading from the mains to the radiators on the upper floors may be made somewhat smaller, owing to the increased elevation and the higher velocity of flow.

Table V may be used for conditions of this kind.

TABLE V (HOT WATER).

Size of Riser.	1st Floor.	2d Floor.	3d Floor.	4th Floor.
1"	30	50	60	70
1¼"	60	80	100	120
1½"	90	120	150	180
2"	180	250	350	400
2½"	320	430	500	
3"	500	600		
3½"	800			

In the case of indirect radiation, each square foot of surface should be counted as two of direct and considered as being located upon the first floor, so that Table V may be used by taking note of these conditions.

For example, 250 square feet of indirect surface is equivalent to $2 \times 250 = 500$ feet of direct, and from Table V is found to require a 3-inch pipe.

Boilers. Heating boilers of the cast-iron, round, or sectional type are usually rated upon the square feet of radiation which they will supply. Boilers of this kind are frequently overrated in trade catalogues and it is usually better to compute the required grate area and select a well proportioned boiler having the required dimensions than to be guided wholly by the rated capacity. Tests show that the weight of coal burned per square foot of grate per hour varies somewhat with the size of the grate, and

under ordinary conditions runs from about 3 pounds for boilers having 1 to 4 square feet of grate up to about twice that amount for those having from 16 to 20 square feet.

This variation depends largely upon the care which they receive and the skill exercised in firing.

Of the heat contained in the coal, about sixty per cent is utilized in the generation of steam, or in heating the water in a hot-water boiler.

Figs. III, IV, and V give the square feet of grate surface for both steam and water boilers for varying amounts of direct radiation. The first of these includes boilers having grate areas from 1 to 4 square feet, and is based upon a combustion of 3 pounds of coal per square foot per hour. The second includes grates from 5 to 10

square feet in area, with a combustion of 4 pounds; while the third is for areas of 11 to 15 square feet, with a combustion of 5 pounds. It will be noted from an inspection of these curves that a given size of boiler will supply considerably more water radiation than steam. This is because of the lower temperature of the water, which causes less heat to be given off per square foot of surface.

Under ordinary conditions a radiator supplied with steam at 2 pounds pressure will give out about fifty per cent more heat per unit of surface than a similar radiator filled with water at an average temperature of 170 degrees.

In estimating the boiler capacity for any given case, a certain factor of safety should be applied to cover radiation losses from the piping, etc. Under ordinary conditions the square feet of surface contained in the radiators multiplied by 1.25, will provide for these losses and give the total radiation upon which to base the boiler capacity.

Here, as in the case of pipe mains, each square foot of indirect radiation should be counted as two of direct.

Example (3). A building contains 400 square feet of direct hot-water radiation; how many square feet of grate area should be provided in the boiler?

$400 \times 1.25 = 500$ total radiation, and from Fig. III we find that practically 3.5 square feet of grate are required.

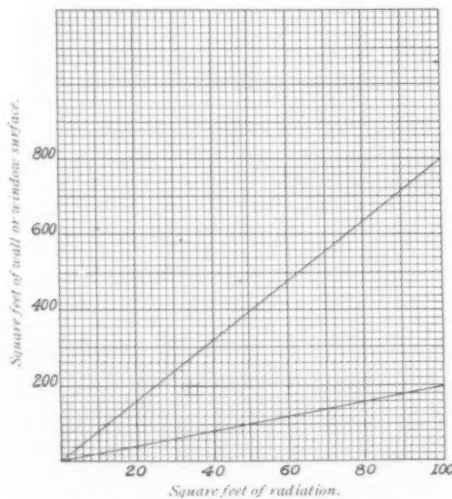


Fig. II. For Direct Hot-Water Radiation.

Upper curve for wall.
Lower curve for glass.

Example (4). A building heated with steam has 1,000 square feet of direct radiation and 500 of indirect; what should be the grate area of the boiler?

$[1000 + (2 \times 500)] \times 1.25 = 2,500$ square feet, total direct radiation to be provided for, and this, from Fig. V, calls for 15.75 square feet of grate.

Similar curves for larger sizes may be plotted by allowing 190 square feet of steam radiation and 280 of water radiation per square foot of grate area for sizes running from 16 to 20 square feet. Tubular boilers are given a horse power rating, which is commonly based on 15 square feet of tube and other heating surface per horse power. Fig. VI gives the horse power rating of tubular boilers for different quantities of direct steam radiation. Boilers of this type are not ordinarily used for hot-water heating, except in connection with forced or mechanical circulation, in which case the water is usually warmed by steam in especially constructed heaters.

Centrifugal Fans. Fans of this type are commonly used for supplying air to halls, churches, schoolhouses, theaters, etc., where a certain standard of ventilation is required.

The capacity of a fan of given diameter depends upon its speed and the resistance against which it operates. The speed is limited in one direction by the required size of fan and the low pressure furnished to the air; while the noise produced with a peripheral velocity much above 3,500 feet per minute limits the speed in the other direction in buildings of the kind named above. Table VI gives data for fans of this type running at a peripheral velocity of approximately 3,000 feet per minute. When necessary they may be speeded up from ten to fifteen per cent without undue noise when properly constructed and mounted, the capacity increasing practically as the speed, within this range.

TABLE VI.

Diameter of Fan.	Revolutions per Minute.	Cubic Feet of Air Moved per Minute.	Horse Power of Motor for Driving Fan.
3"	325	4,500	2
4"	275	8,900	3
5"	225	13,900	5
6"	175	18,300	7
7"	150	24,600	8
8"	125	30,300	10
9"	125	42,900	14
10"	100	46,800	14

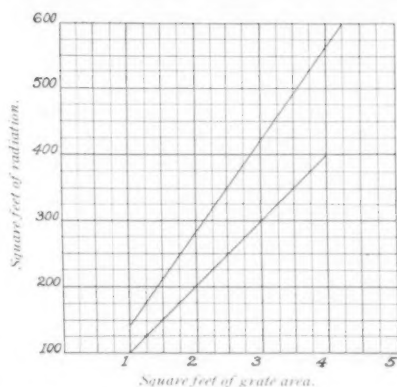


Fig. III. For Determining Size of Cast-Iron Boilers.

Upper curve for water boilers.
Lower curve for steam boilers.

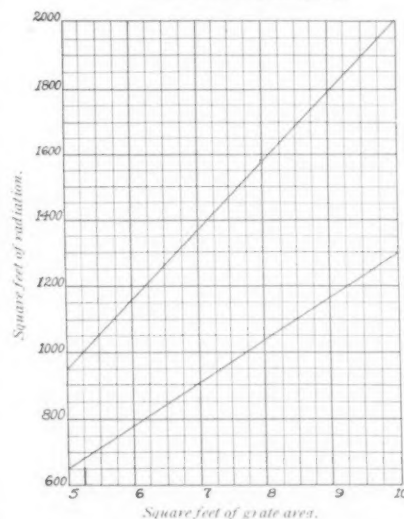


Fig. IV. For Determining Size of Cast-Iron Boilers.

Upper curve for water boilers.
Lower curve for steam boilers.

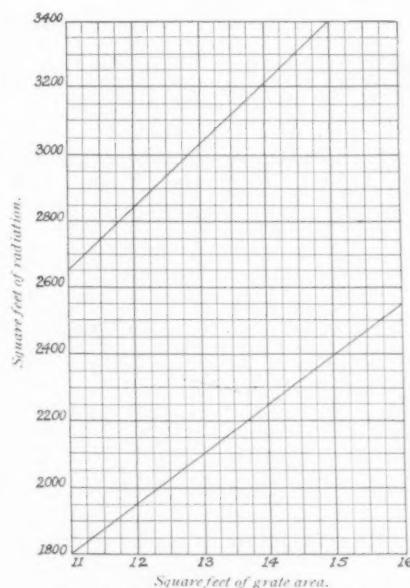


Fig. V. For Determining Size of Cast-Iron Boilers.

Upper curve for water boilers.
Lower curve for steam boilers.

Disk Fans. In the case of disk or propeller fans, Table VII may be used. These data apply to the average conditions of exhaust ventilation where the fan is connected with a system of ducts of ample size. When the fan is placed in a wall or window opening, and discharges directly outward without the use of ducts, the speeds and horse powers for moving a given volume of air may be multiplied by 0.7 and 0.4, respectively.

TABLE VII.

Diameter of Fan.	Revolutions of Air per Minute.	Cubic Feet per Minute.	Horse Power of Motor.
18"	800	1,500	$\frac{1}{4}$
24"	600	2,500	$\frac{1}{2}$
30"	500	4,000	$\frac{3}{4}$
36"	400	6,000	1
42"	350	8,000	$1\frac{1}{2}$
48"	300	10,000	2
54"	250	12,000	$2\frac{1}{2}$
60"	225	16,000	3
72"	200	24,000	4

Main Heaters. The required depth of a heater for use with a fan depends upon the final temperature to which it is desired to raise the air.

Table VIII is based upon an average air flow of 1,000 feet per minute between the pipes, a steam pressure of 5 pounds, and the entering air at zero.

TABLE VIII.

Rows of Pipe Deep.	Final Temp. of Air.	Rows of Pipe Deep.	Final Temp. of Air.
4	42°	16	125°
8	70°	20	135°
12	95°		

When the air is to be used simply for ventilating purposes, and is introduced at a temperature of 70 to 75 degrees, heaters 8 to 10 pipes deep are commonly used; but in the case of churches, halls, theaters, etc., where the warming is also done by the main heater, temperatures of 110 to 120 degrees are called for, and heaters containing from 14 to 16 rows of pipe are used.

The efficiency, or heat units per square foot of surface per hour, depends upon the depth of the heater, the velocity of air flow through it, the steam pressure, and the temperature of the entering air.

Table IX gives the efficiencies for heaters of different depths, with an air velocity of 1,000 feet per minute, steam at 5 pounds pressure, and the entering air at zero.

TABLE IX.

Rows of Pipe Deep.	Efficiency in B. T. U. per Sq. Ft. per Hour.	Rows of Pipe Deep.	Efficiency in B. T. U. per Sq. Ft. per Hour.
4	2,100	16	1,500
8	1,900	20	1,300
12	1,700		

The amount of heat in B. T. U. required to warm a given volume of air through any range in temperature is given by the formula,

$$H = \frac{V \times T}{55}, \text{ in which}$$

H = the total heat required in B. T. U.,

V = volume of air in cubic feet,

T = rise in temperature in degrees.

Example (5). A school building requires 1,700,000 cubic feet of air per hour at a temperature of 70 degrees in zero weather. How deep should the main heater be, and how many square feet of surface should it contain, assuming a steam pressure of 5 pounds and an air velocity of 1,000 feet per minute?

Referring to Table VIII it is found that the heater should be 8 pipes deep to give the desired final temperature, while the efficiency for an 8-row heater is given as 1,900 in Table IX. The total heat required per hour is found from the formula to be,

$$\frac{1,700,000 \times 70}{55} = 1,400,000$$

B. T. U., and this divided by the efficiency calls for $1,400,000 \div 1,900 = 737$ square feet of heating surface.

Practical Considerations. The following points should be taken into consideration when drawing up a set of heating specifications or when passing upon those of others.

The plant should be of sufficient capacity to maintain an inside temperature of 70 degrees in zero weather, without forcing the boiler beyond the point of *economical* operation to effect this.

Two-column radiators are more efficient than deeper ones and should be used when there is sufficient space for them. Make the radiators of symmetrical proportions; reduce the height for the smaller sizes instead of the length. Consider the furniture and the use of the room when locating direct radiators. While theoretically the source of heat should be placed in the coldest part of the room, a radiator or register in almost any part of a small or medium size room will produce an even temperature.

Do not leave the gilding or painting of the radiators to the steam fitters' helper. This work is a part of the interior decoration and should be done in a manner to harmonize with the special finish of the room.

The single-pipe system of steam supply is the best for dwelling houses and similar buildings, as it reduces the number of risers and valves one-half, and prevents the flooding of floors and ceilings by neglecting to close the return valve.

Hot-water systems operate nicely on a downward supply, with the supply and return at the same end of the radiator and connected with the same drop. This arrange-

ment does away with separate return drops and makes the system self-venting, thus doing away with air valves on the radiators.

Place the expansion tank where there is no danger of freezing or else provide it with a special circulation pipe. Carry the vent from an expansion tank through the roof, and the overflow to a basement sink as a "tell tale" to indicate when the tank is full.

If it is arranged to add water at the tank, provide a gauge glass; if the connection is in the basement, provide an altitude gauge.

Carry up all risers in the corners of rooms, behind doors, and in closets so as to conceal them as much as possible. Never run a riser on a conspicuous wall.

Grade all pipes in the right direction and avoid pockets for the accumulation of condensation in steam systems and of air in water systems. If it is desired to keep the basement cool, insulate the pipes with a good form of sectional covering. Heat radiated from the boiler and piping, however, is not lost, as it rises to the rooms above and also warms the floors on the first story.

Floor registers are convenient for warming the feet, but are often in the way of carpets and rugs, besides catching a considerable amount of dirt. Baseboard registers avoid most of these objections and are easier to install, especially on the upper floors.

In selecting a heating system the following points should be kept in mind. A furnace is the cheapest to install, easiest to regulate as to

temperature, and furnishes fresh air for ventilation. On the other hand, it is quite likely to heat the rooms unevenly in cold and windy weather, and its use should, in most cases, be limited to buildings of small and medium size.

Steam, both direct and indirect, is well adapted to cold climates and exposed locations. It is also adapted to buildings of all sizes.

Direct steam furnishes no fresh air for ventilation, but this defect may be overcome by using indirect stacks for the more important rooms. The principal objection to steam is the difficulty of temperature regulation except by the use of expensive automatic devices.

Hot water is especially adapted to the warming of dwelling and apartment houses on account of the ease with which it is regulated. It may also be used for ventilating purposes by employing indirect stacks the same as for steam.

The principal objection to hot water is the danger of freezing in extreme weather, which makes it necessary to circulate the water to a certain extent through all of the radiators, whether the rooms are in use or not.

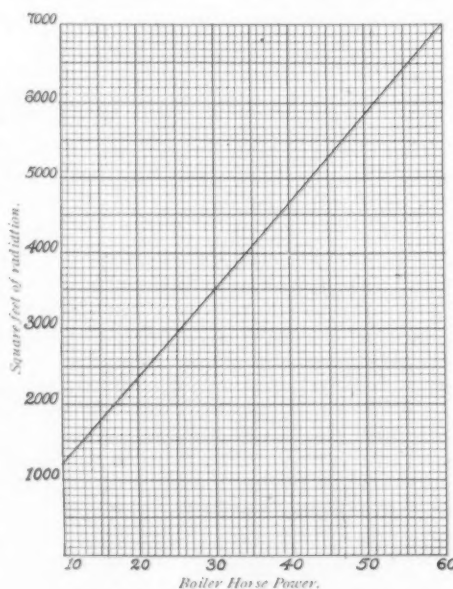
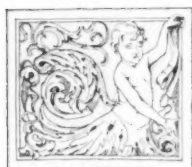


Fig. VI. For Determining Size of Cast-Iron Boilers.

Upper curve for water boilers.
Lower curve for steam boilers.

DISTINCTIVE AMERICAN ARCHITECTURE



A SERIES OF ILLUSTRATIONS
OF THE MOST NOTABLE
WORK OF THE YEAR WITH
APPRECIATIVE TEXT BY



MONTGOMERY SCHUYLER

THE problem of the steel-framed, skyscraping hotel is architecturally so serious that an architect may almost be pardoned for abandoning it as insoluble. The architecture is, equally with the architecture of the skyscraping office building, apian, for by far the greater part is an aggregation of single cells for which the honey-comb offers the only precedent among the organisms of nature. In the case of the new hotel, which offers one of the most conspicuous and quite the most towering of the members of the group of which the new Grand Central Station in New York is the nucleus, the essential problem was, as we shall see, much complicated with special difficulties of adjustment and construction. For, like the other members of the group, the new hotel is reared above a network of railroad tracks. These it is obliged to straddle and in various ways circumvent, so as not to interfere in the smallest degree with their reticulation or to obstruct their fair-leadings and clearances. Consider this condition and you will understand that the actual points of support of the building, which carry its weight to its foundations, must be put not where you would have them if you were free to put them where they "ought" to be, but where you must put them to prevent them from getting in the way of the traffic. This is the primary condition of the whole enterprise, that the tracks shall be unobstructed and have the right of way over all other construction and architecture whatsoever. Not only is this skyscraper a honeycomb like all the others; it is a honeycomb set on stilts extending unusually

The Biltmore Hotel Madison Avenue, New York

WARREN & WETMORE, ARCHITECTS

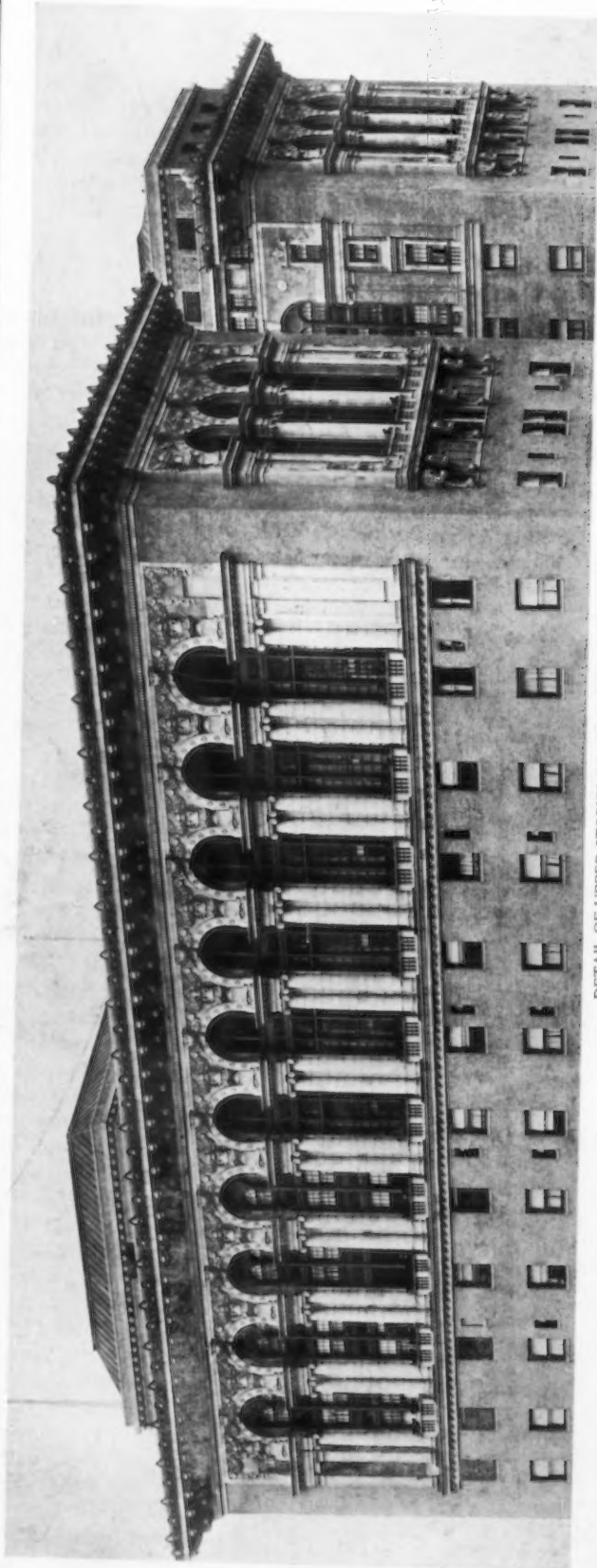
far below the visible structure, and these stilts are set not where the designers would have chosen to set them if they had been free to choose, but where they could get them in in deference to the paramount claims of structural necessities which had nothing to do with those of their building. It is true that the structural troubles of an architect have nothing to do with the critic of the finished product, whom it is the architect's business to make forget that there were any such troubles. They may and must be mentioned in the case even of an exclusively architectural consideration of the Biltmore, because they have left their scars on the completed edifice, and produced dispositions unintelligible without reference to them.

It is true that the architect of a skyscraping hotel has advantages over the architect of a skyscraping office building. To follow the triple division which has imposed itself upon all designers of skyscrapers whatever, and follows out the analogy of the division of the classical column into base, shaft, and capital, again pursuing the Aristotelian precept that every work of art must have a beginning, a middle, and an end, is a much easier prescription to comply with in an hotel than in an office building. And this because in an office building it is difficult, and in most cases impossible, to give to the three members of the classic "order" proportions and relations which will be tolerable to the spectator habituated to the classic examples, without making the division arbitrary, illogical, and unfounded in fact. The architect who attempts to retain classical proportions

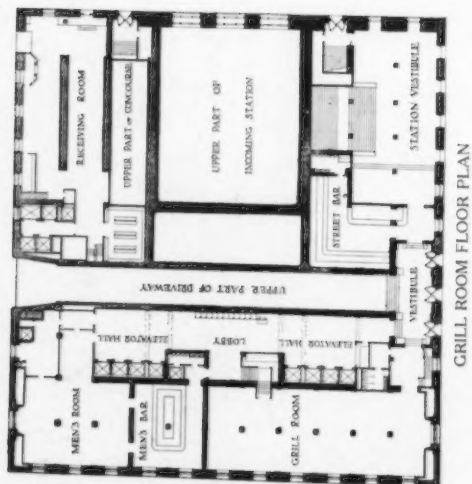


View of 43d St. and Vanderbilt Ave. Façades.

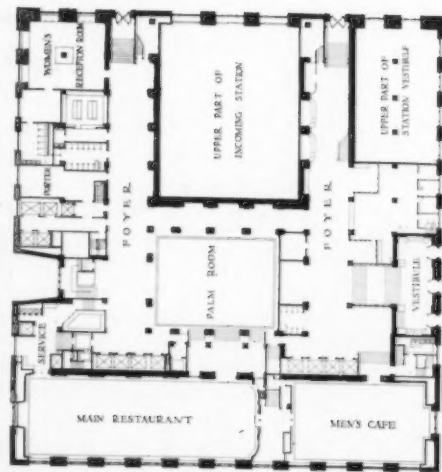
THE BRICKBUILDER.



DETAIL OF UPPER STORIES OF 43D STREET ELEVATION



GRILL ROOM FLOOR PLAN



MAIN FLOOR PLAN



TYPICAL FLOOR PLAN

THE BILTMORE HOTEL, NEW YORK, N. Y.
WARREN & WETMORE, ARCHITECTS

in a tall office building comes into collision with a rule founded quite as much in the nature of things as Aristotle's precept, and that is the rule formulated by Mr. Louis Sullivan, "Where function does not vary, form does not vary." For, in fact, in an office building it is only the single story containing the shop fronts of the street level that demands or justifies a separate treatment. Above this, the superstructure is all honeycomb, until we arrive at the very top, where there may be another single crowning story devoted to the operative machinery of the structure. Proportions negotiably classic, in the case of a building say of twenty stories, would require a base of three stories at least, and a capital of as many. It is one of the distinctions of the Woolworth Building, the latest and tallest of the office buildings up to date, that the classical convention has been ignored and the base is only the single high story which can be logically differentiated from the shaft by the character of its uses and its occupancy. But, of course, it is much more convenient and comfortable for the architect if the practical uses of his building allow him a base and a capital which bear a more conventional relation to the shaft of small and single cells; and this is the case when the building is an hotel.

We find that the architects of the Biltmore, if they have not succeeded in dissembling all their misfortunes, have at least made the most of their advantages. The bulk of their building, the many storied brown brick shaft, consists like the office building of single cells, only sleeping rooms instead of working rooms, without even so much distinction as exists among those of the honeycomb, where one finds that the queen cells are at least larger than those of the workers, and each cell, in the case of the hotel, having a subordinate slit alongside, denoting the invariable bath. There is no help for this, and indeed the architects are entitled to no sympathy on account of it, provided only they can find plausible occasions for differences in the treatment of what may be called the public rooms of their building. The architects of the Biltmore have

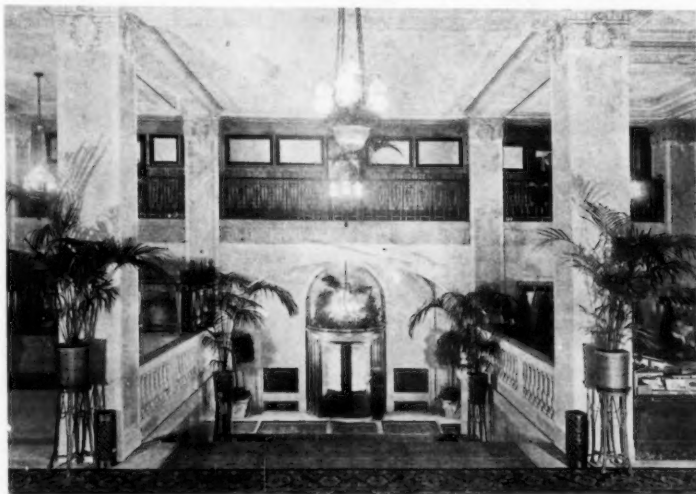


Models of Terra Cotta Ornament.

managed to find it, insomuch that they have made of their architectural base a seven-story building, complete in itself, upon which they have concentrated their architectural efforts, and the spectator is expected to concentrate his inspection, kindly ignoring the great brick shaft above as more or less a necessity which he need not look at unless he likes. The separate treatment of the base as a complete architectural entity has been carried further in this case than in that of any other of the sky-scraping hotels, and constitutes the chief distinction of the building.

It is easy for the spectator to follow the implicit injunction given to him by the architects to look at the base and look at nothing else. The total area of the hotel is about 40,000 square feet. The streets are narrow; even Madison avenue, which is the widest of them, is narrow compared with the enormous height of the total structure. They are narrow even compared with the base, so that from any one of the opposite sidewalks the spectator has to look up quite as steeply as is comfortable to the crowning member of the base. The angle must be 60 degrees or steeper, and the base would be, quite as lofty as would normally be built facing such streets if the construction were composed, as it appears to be of walls capable of carrying themselves. It is, however, not solid masonry but the usual steel frame with a facing of limestone, excepting the crowning member, which is a frieze in architectural terra cotta. As is the case even in the most commercial of skyscrapers, the architects "have their exits and their entrances." They have also a tall arcade, which is counted as three stories in the above enumeration of the total height as seven,

which is continued on all four sides, and which often justifies itself by opening upon great apartments, dining rooms and the like, which occupy the total height, elsewhere subdivided into lower rooms according to the exigencies of the "lay out." Below it is a story of square openings level with the sidewalk. Above are two more stories of normal dimensions, and a transitional story between two



Hotel Lobby, looking toward 43d St. Entrance.

molded "cordons." The arcade, however, is really "the thing," and may be said to comprise the architecture of the base, the story below and the stories above being subordinate appendages to it. It is, by its scale and generally speaking by its treatment, entitled to its preeminence and its conspicuousness, having in fact a stately effect and being a valuable addition to the street architecture of New York. It has a defect which detracts from the potential effect of the feature may be seen in those places where the lack of emphasis which comes from the omission of a vigorous horizontal member is partly supplied by the well designed metallic lanterns which are so placed as to indicate the points at which the arcade needs the invigoration which such a member would supply. The well meant punctuation given by these ornaments, good so far as it goes, ought clearly to be carried further. On the other hand, the light iron balconies under the windows of the story just over the great arcade have an excellent effect, and upon the whole the base of the Biltmore is a success. It is an earnest of even greater successes hereafter, when the method that has been followed here of treating the base of a skyscraper as a complete and separable structure has excited imitation and emulation, as one would say that it is quite sure to do.

On the east side, the side towards the Grand Central Station, there is more room and a freer outlook than on the other three sides, where the narrow streets shut off the main bulk of the building from effective observation. This advantage has been utilized to the utmost. The separateness of the base is on this side emphasized by an actual recession of the superstructure from the plane of the wall of the base—a recession emphasized by converting it into a platform, available at the right season as an open air lounging place, crowned with a pergola and fronted with the frieze in architectural terra cotta, which is one of the best things in the building as a piece of design and also of execution. One would be



Main Foyer.

here than either of the wings it separates, which does not prevent them from offering rather puzzling questions, not soluble in the exterior view with which alone these remarks are concerned, as to how the middle suites of apartments are effectively illuminated. But one sees from here that a logical basis has been found for a lofty base. The "capital," a close arcade equal perhaps in height to three tiers of the cells which constitute the shaft, occupies the space with single apartments sometimes of its full height. What is to the point is to observe how the columns of this upper arcade are so queerly placed as to impend sometimes over voids, instead of over what seem to be, but of course are not, solid piers of brickwork. It appears that this anomaly is one of the results of having to place the feet of the stilts away down among and beneath the trackage, not where they ought to be, but where they can be placed. Fortunately, to apprehend the anomaly from near the building involves some eye strain, to say nothing of the risk of cervical dislocation; while at a distance across the city roofs, from which the upper stories of the Biltmore become effectively visible, the irregularity seems not to be apprehensible at all. The general effect of the arcade is pleasing, and without being too unacademic we can safely credit it as a successful termination to the building. The richest decoration of the

entire façade is concentrated on this feature, and not without logical reason, for within this space is located the ballroom and the larger apartments of the hotel. The execution of the detail in architectural terra cotta is particularly free, and the lightness and grace of the forms reproduced in this material will make the upper portion of the Biltmore a notable addition to the diversified sky line of New York.



Gentlemen's Lounge and Café.



THE BILTMORE HOTEL, NEW YORK, N. Y.
WARREN & WETMORE, ARCHITECTS

U of M

M70U



PALM COURT

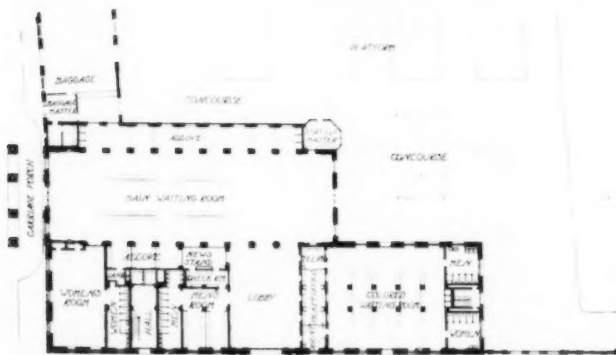


MAIN RESTAURANT

THE BILTMORE HOTEL, NEW YORK, N. Y.
WARREN & WETMORE, ARCHITECTS

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MAIN FLOOR PLAN



THIRD OFFICE FLOOR PLAN

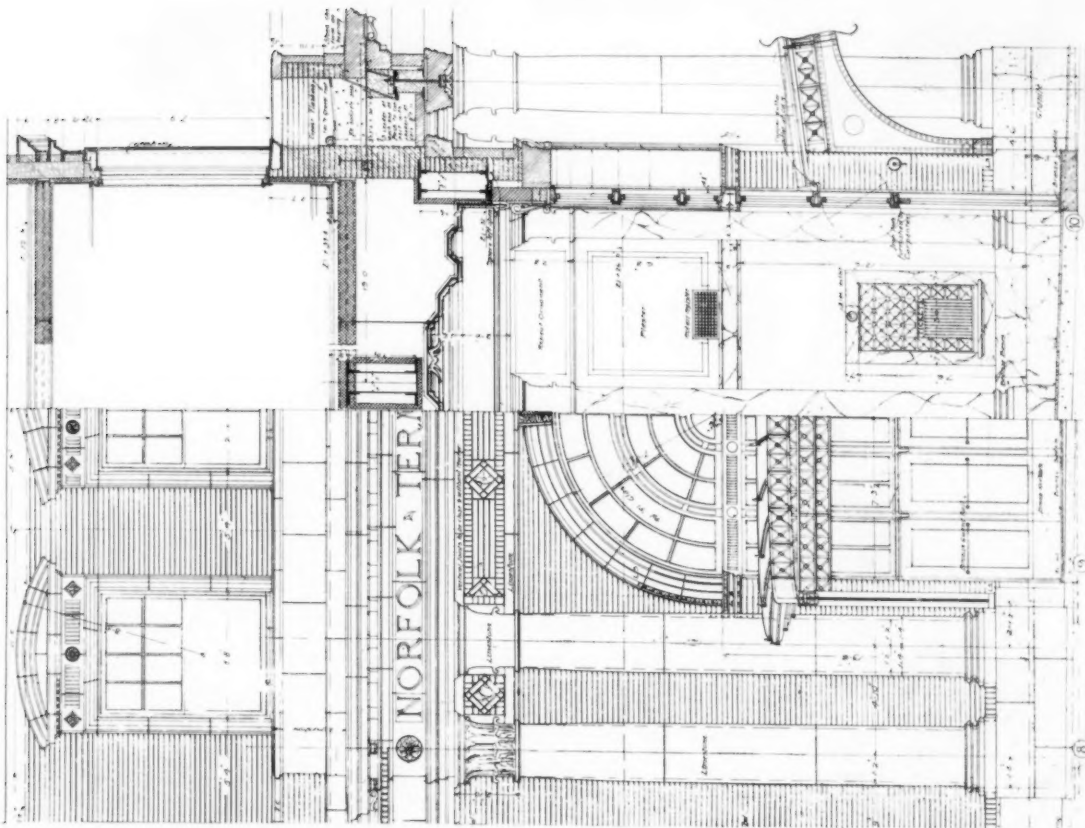


FOURTH OFFICE FLOOR PLAN

UNION STATION, NORFOLK, VA.
STEM & FELLHEIMER, ARCHITECTS

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DETAIL OF MAIN ENTRANCE

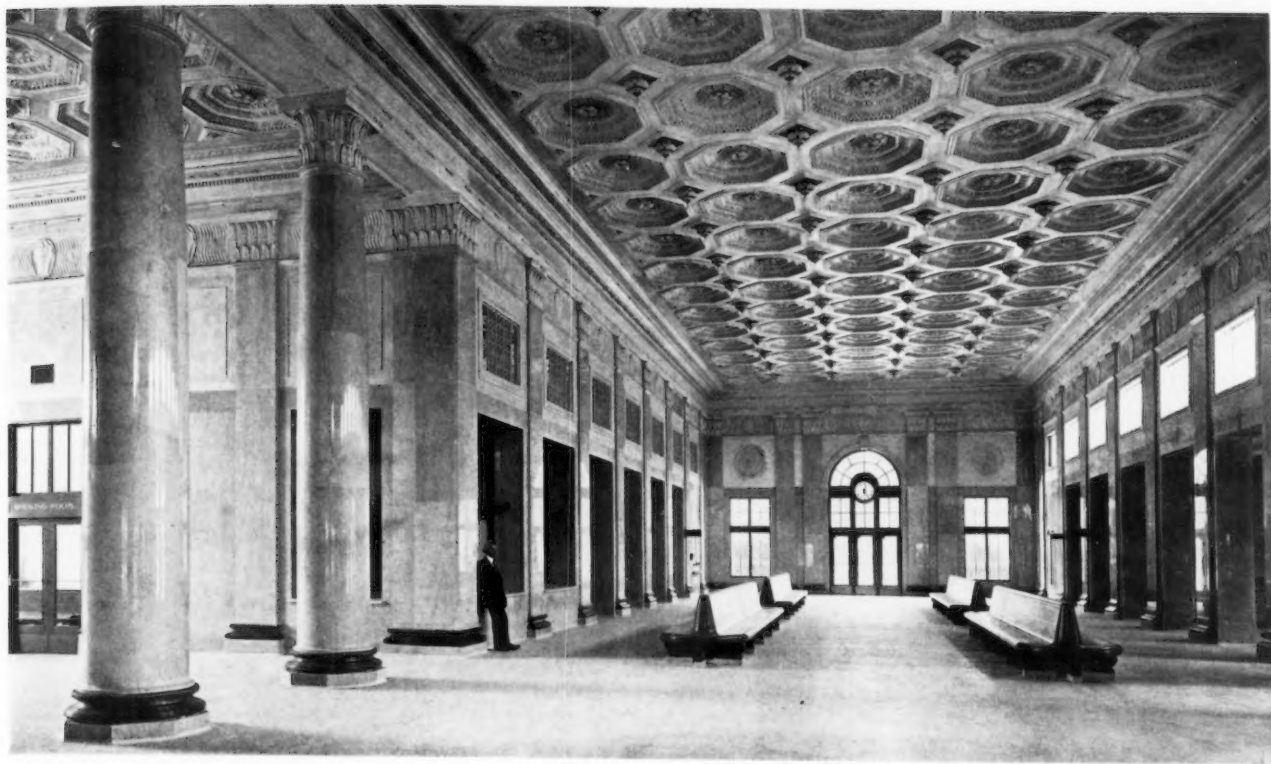


MAIN ENTRANCE

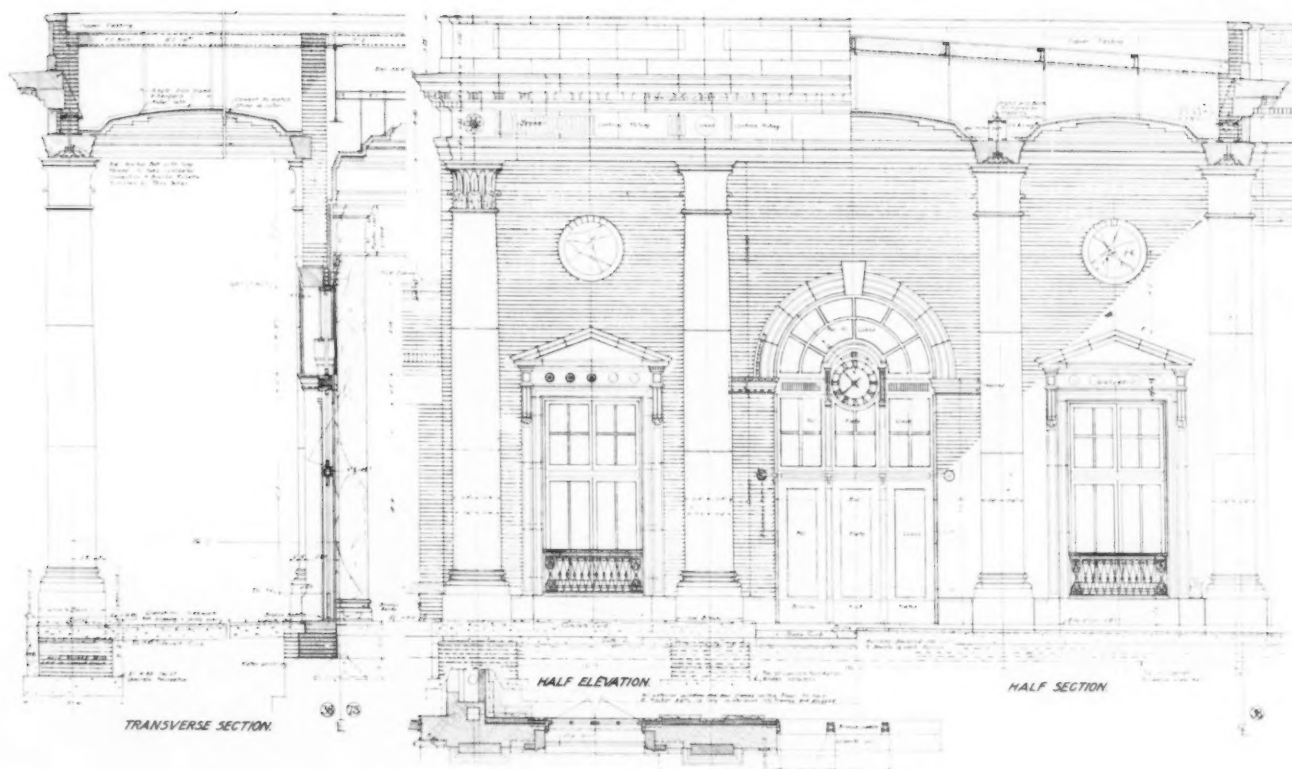
UNION STATION, NORFOLK, VA.
STEM & FELLHEIMER, ARCHITECTS

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MAIN WAITING ROOM



DETAIL OF CARRIAGE PORCH

UNION STATION, NORFOLK, VA.

STEM & FELLHEIMER, ARCHITECTS

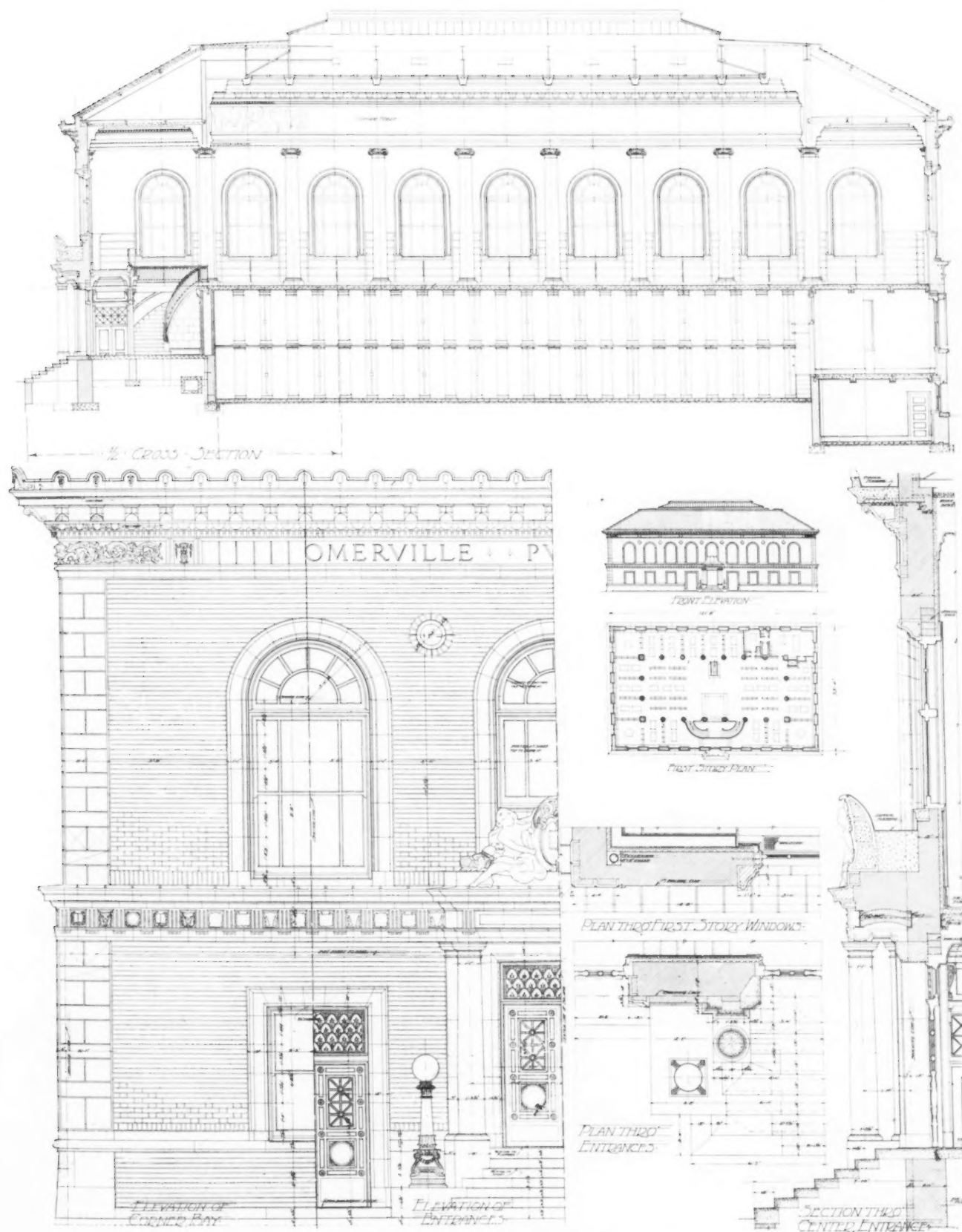
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PUBLIC LIBRARY BUILDING, SOMERVILLE, MASS.
EDWARD L. TILTON, ARCHITECT

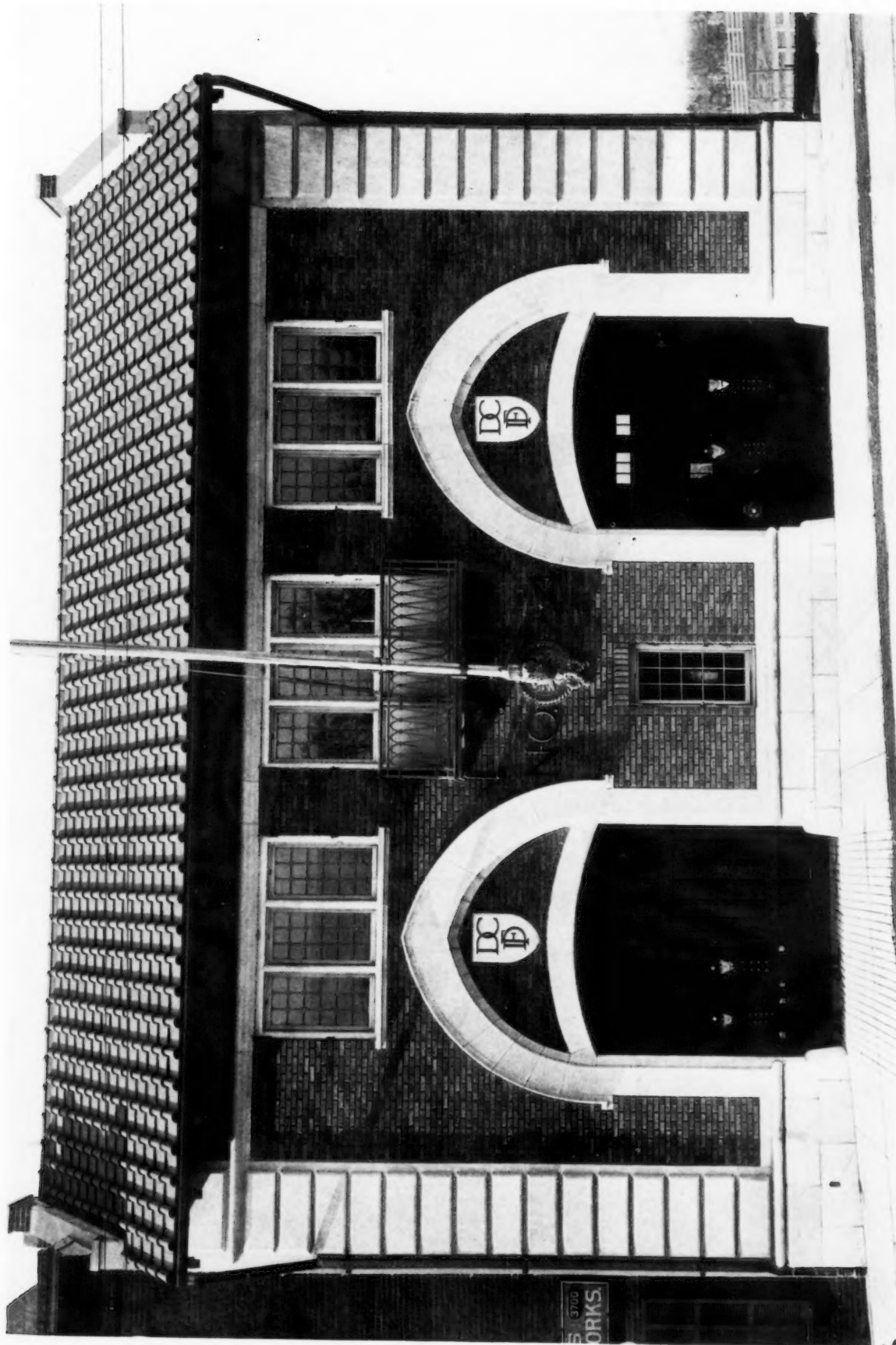
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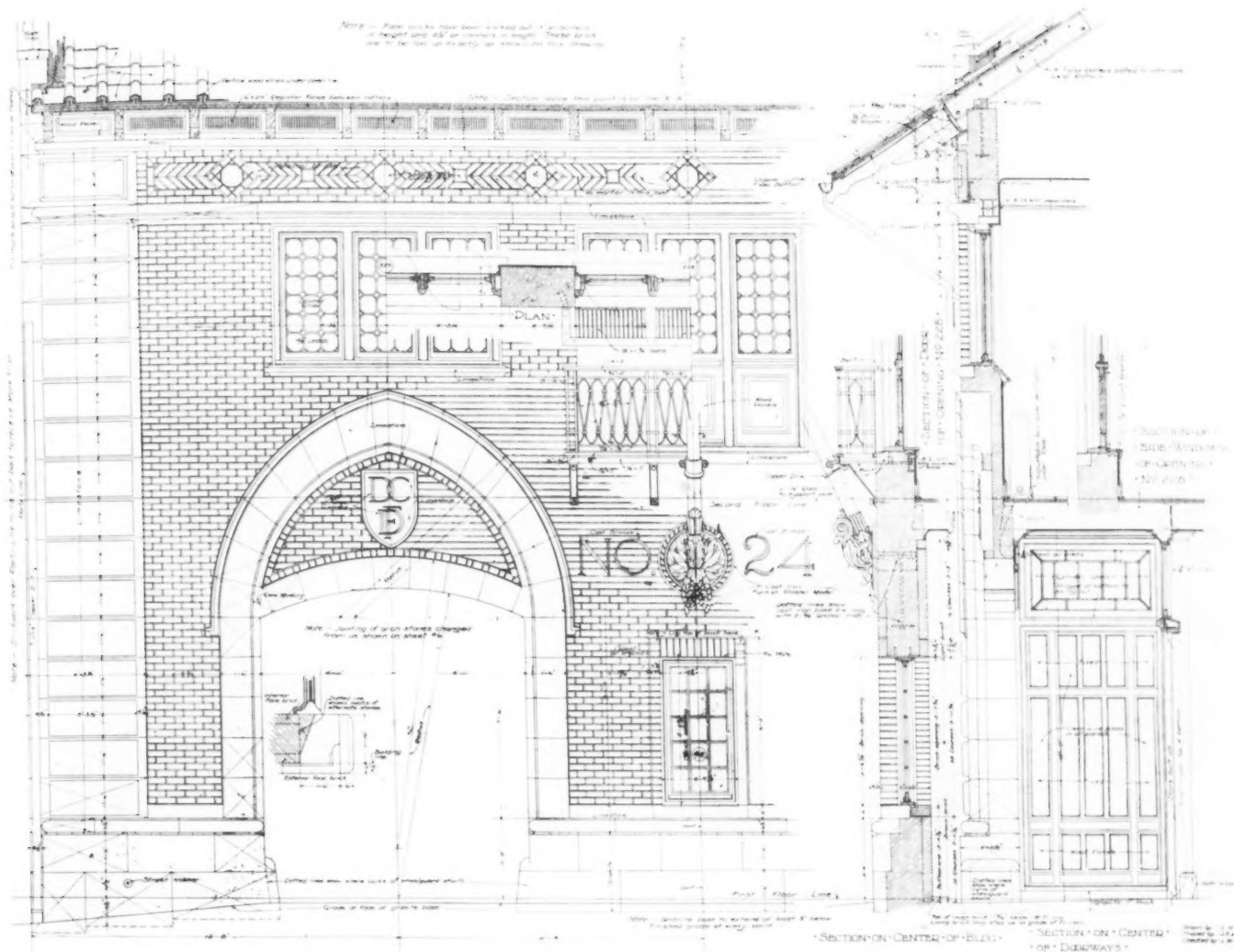
PUBLIC LIBRARY BUILDING, SOMERVILLE, MASS.
EDWARD L. TILTON, ARCHITECT

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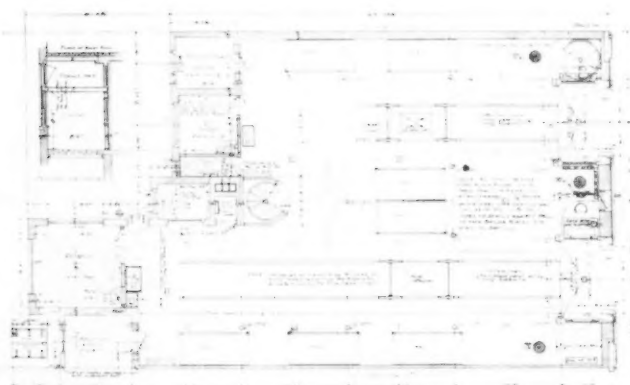


FIRE HOUSE FOR THE DISTRICT OF COLUMBIA, WASHINGTON, D. C.
GREGG & LEISENRING, ARCHITECTS
SNOWDEN ASHFORD, MUNICIPAL ARCHITECT

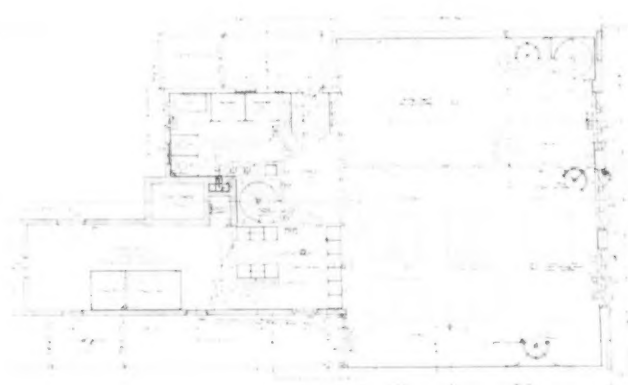
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DETAIL OF ELEVATION AND SECTION THROUGH FRONT WALL



FIRST FLOOR PLAN



SECOND FLOOR PLAN

FIRE HOUSE FOR THE DISTRICT OF COLUMBIA, WASHINGTON, D. C.

GREGG & LEISNER, ARCHITECTS
SNOWDEN ASHFORD, MUNICIPAL ARCHITECT

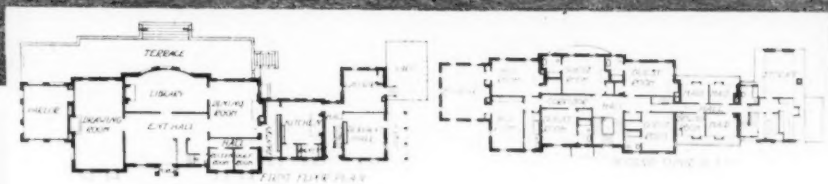
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GARDEN FRONT

HOUSE AT SOUTHAMPTON, LONG ISLAND, N. Y.
F. BURRALL HOFFMAN, JR., ARCHITECT

FORM



GARDEN

HOUSE AT SOUTHAMPTON, LONG ISLAND, N. Y.
F. BURRALL HOFFMAN, JR., ARCHITECT

M70U



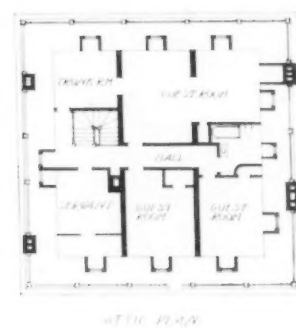
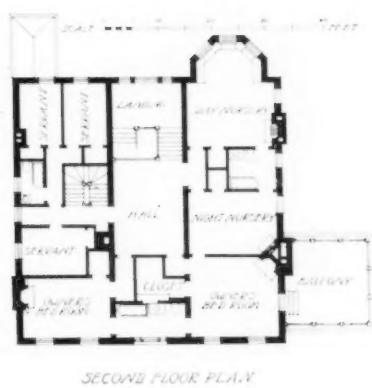
DRAWING ROOM



ENTRANCE HALL

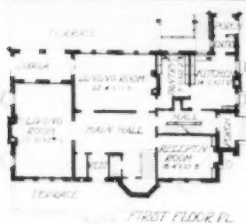
HOUSE AT SOUTHAMPTON, LONG ISLAND, N. Y.
F. BURRALL HOFFMAN, JR., ARCHITECT

1904

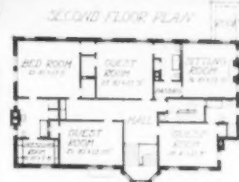


HOUSE AT NEW HAVEN, CONN.
R. CLIPSTON STURGIS, ARCHITECT

M70U



STREET ELEVATION



HOUSE AT ST. LOUIS, MO.
MAURAN, RUSSELL & CROWELL, ARCHITECTS

M70U



DETAIL OF WALL TREATMENT

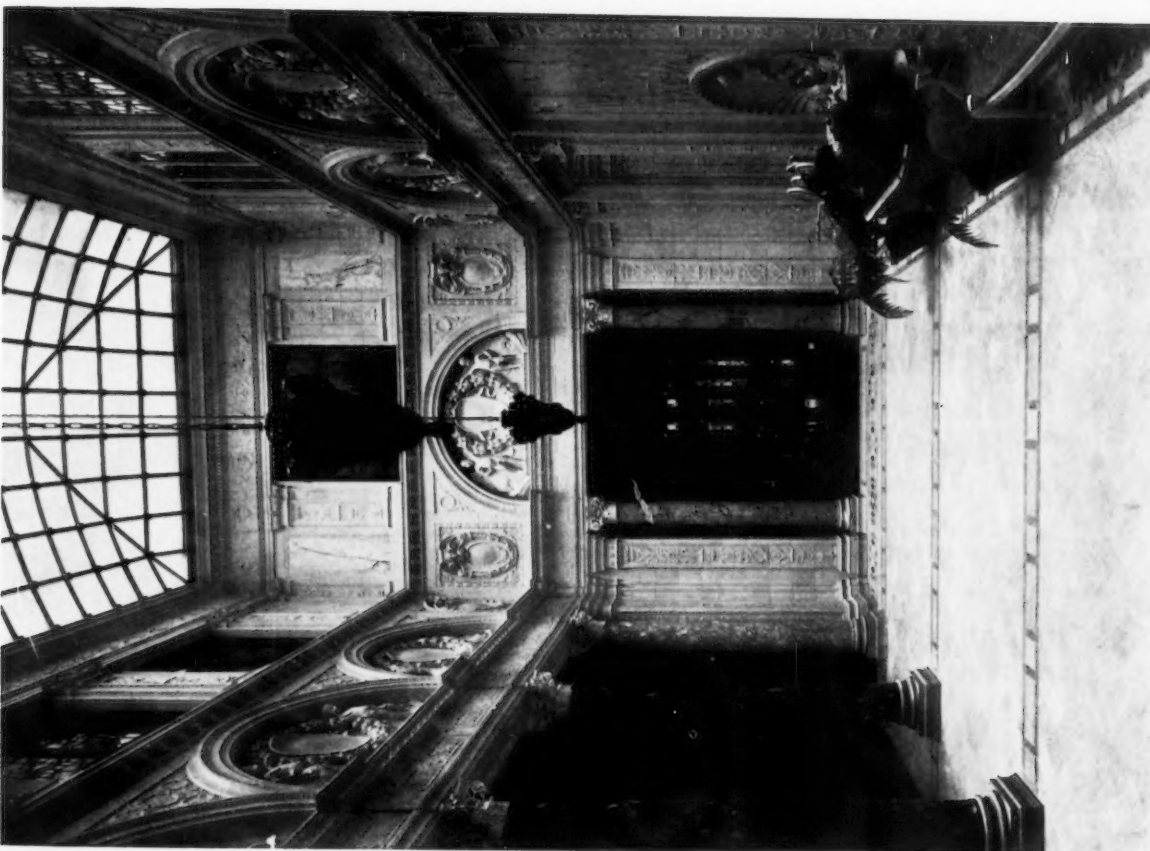
THE PATIO OF A HOUSE IN NEW YORK, N. Y.
HOWELLS & STOKES, ARCHITECTS

UoFM

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DETAIL OF CORNER TREATMENT



VIEW LOOKING TOWARD DINING ROOM

THE PATIO OF A HOUSE IN NEW YORK, N. Y.
HOWELLS & STOKES, ARCHITECTS

U OF N

104M

A City House of Unusual Plan.

ITS WELL LIGHTED INTERIORS ACHIEVED
BY THE INCORPORATION OF A PATIO.

By M. B. STAPLEY.

ONE of the most interesting and artistic city homes built in recent years is that at 33 East 69th street, New York, Howells & Stokes, architects. All it has exteriorly to proclaim this fact is a twenty-five-foot façade, for the lot is not a corner one. This façade, redolent of some little late Renaissance palace in Rome, promises an interior of good taste; but it cannot prepare one for what is the real triumph of the planning, viz., an interior flooded with light and sunshine.

How to secure this result on a typical city lot of twenty-five by one hundred feet becomes steadily more difficult, for adjacent buildings are usually higher and deeper than they were some years ago, even to the entire suppression of the rear yard; while present-day clients are no longer satisfied with insufficiently lighted and monotonously planned rooms. They want instead large light rooms, foyers, and impressive stair treatments.

The solution in this case was to build the house around a patio, Spanish fashion, which patio practically divides it in two laterally, with the staircase and hall as connecting link between front and rear portions. At the top of the second story the patio is glazed over; meanwhile it serves as the nucleus of the first and second floor plan, and besides, the *chef-d'œuvre* of the whole house.

To reach it one passes through an outer vestibule treated in sgraffiato work, an inner in Istrian marble, and reminiscent of the charming stair landings of the Palazzo Mattei, and a reception room even more typically Italian, with vaulted plaster ceiling in low relief. All these rooms are three steps below the patio level. Between them and it there is structurally no separation; neither is there at the opposite end where the dining room adjoins. Instead, privacy is obtained in each instance by means of wondrously carved and gilded open screens, which on one side are hung with heavy velour curtains. Between such a demarcation and the usual

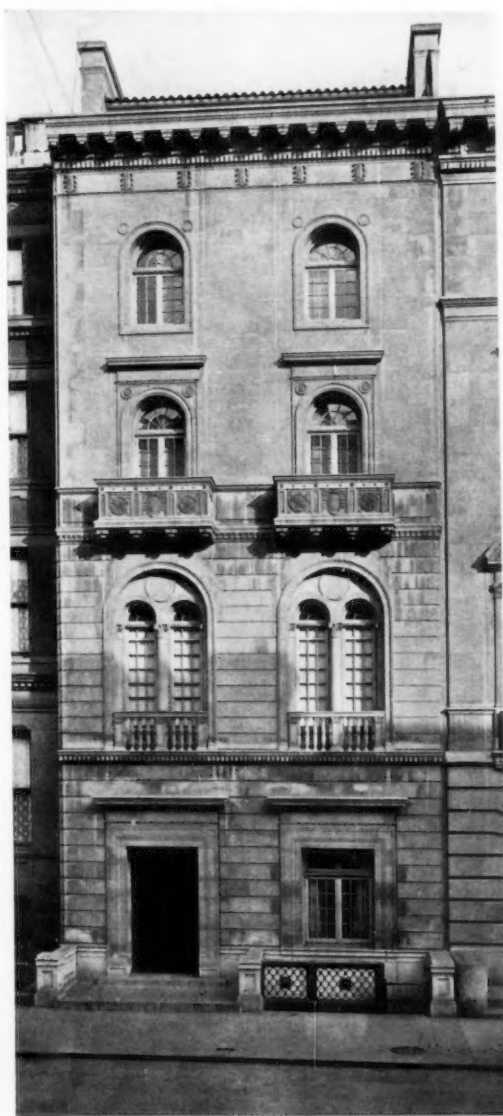
solid paneled doors or wall there is no comparison for illusiveness and decorative effect, while the degree of exclusion is the same.

Passing through the gilded screens the dining room presents a study in decorative color—paneled wainscot and an elaborate wooden beamed ceiling, gilded and patterned, studded here and there with *lapis lazuli* blues. Its outlook, aside from its juxtaposition with the patio, is onto the little garden yard which has been made attractive by means of a Florentine wall fountain and some planting.

The two principal rooms of the second story are the drawing room and library, both of which have casemented

windows looking down into the patio—an idea both romantic and effective. As a study in plaster work, and by this is meant the real stucco-duro of the Italian Renaissance, there is little in this country to surpass the drawing room. Although spoken of as stucco-duro, the style is really patterned after the work of the Adam Brothers; that is to say, it is distinguished by an arrangement of circles, ovals, octagons, vases, wreaths, sphinxes, and medallions, containing mythological subjects. As an example of twentieth century modeling it is incredibly fine. The library, approached by a charming old Spanish door and postern, is treated in dark woods. A room with a northern exposure, it would ordinarily be cheerless, but is enlivened in this case not only by the sun's rays filtering in from the patio, but by the view into the patio below, with its trickling little fountain and the darting goldfish in the old Roman sarcophagus basin.

Returning to the patio, a number of features combine to make it an extraordinary achievement for so limited an area—its feeling of space, its tone, and the quality of workmanship put into its material. This does not refer to the rich marbles, mosaics, etc., that all play their part and play it well, but to the dominant material, terra cotta.



Street Façade

Howells & Stokes, Architects

Before selecting it, much thought had been given to finding a sympathetic treatment of the walls. To create a novel effect was never the actuating motive; simply to make a cheerful, beautiful room that could be lived in and enjoyed daily, just as the Spanish patio is. The house being Italian Renaissance in inspiration, marble was first considered, especially as there were several very fine antique Pavanazzo marble columns to be worked in; but after several kinds of marble had been assembled and tried, it had to be admitted that its hard surface failed to impart the right warmth and intimacy. To carve it into a warmer play of light and shade would have been prohibitive in price; and straightway those who had the matter in hand dropped from sumptuous marble to plain, workaday terra cotta. That its texture was the responsive, sympathetic one sought for, was apprehended from the start. Its varied and sparkling surface played in a fascinating way with the steady white light filtering through the glazed roof of the court.

Perhaps the greatest charm of the room—its greatest charm certainly to one who understands the scope and the limitations of this material—is that it was all actually designed for terra cotta. No end of research was made through a mass of old time terra-cotta ornament; classic, of course, for the patio was to be harmonious with the adjacent dining and reception rooms. Yet in the wealth of classic examples that have come down to us, nothing seemed quite delicate and haunting enough to stand the

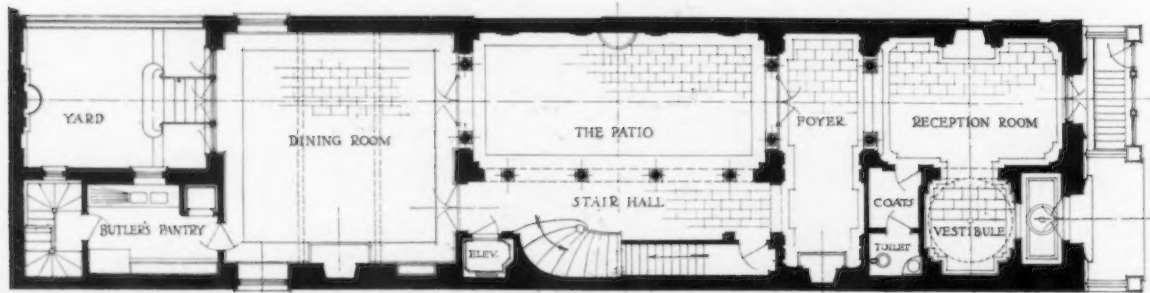


Reception Room Looking Toward Inner Vestibule.

strong unvarying flood of light from the patio roof. It was all too positive, too assertive; and so small figures and medallions were designed, as delicate in spirit as those Wedgwood and Flaxman designed for their immortal pottery, the modeling kept very flat and the drawing in places incised in a way that completely expressed the plasticity of the material. The success of these brings up the question why is it that, being perfectly familiar with this fugitive sort of delicacy in pottery and in the smaller expressions of Greek art, no one has recognized sooner how it may be made the keynote of beauty in treating a room?

In this room there is an ivory-tinted band eight inches high in

the architrave of oval medallions, enclosing cameolike figures, alternating with highly conventionalized flowers, that is an unusual bit of well-studied, unobtrusive decoration. Above in the lunettes the design and relief become bolder—amorini supporting heavy wreaths. With the exception of some dry leathery tones in the backgrounds no variety of color has been introduced in the terra cotta; but due to the strong coloration in the Alexandrinum pavement and in the mottled and veined Pavanazzo columns, there is a feeling of polychrome treatment in the room. The modeling is of course all very flat—so light that when the glaze was added the patterns became in many cases fascinatingly vague. It makes one think of those only half-breathed designs in terra cotta on the façade of the Orotorio of San Bernadino at Perugia.



First Floor Plan.

House in New York City.

Howells & Stokes, Architects.

The Lighting of Public and Semi-Public Buildings.

SIXTH AND CONCLUDING PAPER.

By L. B. MARKS.

Consulting Illuminating Engineer, New York City.

GAS LIGHTING.

RECENT improvements in the control of gas lighting, that is to say, the lighting and extinguishing of individual burners or groups of burners by pressing a push button conveniently located, have opened up a more extensive field for gas lighting than heretofore, especially in public and semi-public buildings.

Mr. Thomas Scofield comments on the methods of ignition and extinguishing of gas lamps as follows:

"With the advent of the incandescent mantle burner came the development of the pilot ignition system. This consists of a small by-pass around the main gas cock, allowing a small stream of gas to pass through a small tube, terminating in a small open flame tip located close to the mantle. This tip or pilot remains lighted when the gas is turned off from the burner, and on again turning the main gas cock it ignites the gas issuing from the nozzle, thus lighting the lamp. These pilots consume but a very small quantity of gas, ranging from one-tenth to one-eighth cubic foot per hour, depending somewhat on the pressure and adjustment.

Several systems have been developed for the distant control of gas lights which do not depend upon the pilot light for ignition. Two of these will be described briefly. The first is one application of the magnet valve and the principle of the spark ignition. Each burner is fitted with a sparker, a device similar to the spark plug used in automobile work, consisting of a porcelain armed sparker containing two spark points, binding posts, and device for attachment to the lamp. For a single lamp, this sparker is connected to the secondary circuit of an induction coil, the primary circuit of the coil being connected to the terminals of a group of dry batteries or storage battery. On this primary circuit are also connected the magnet valve and push buttons, while the secondary circuit carries a push button for operating the sparkers. In the case of a number of lamps, the sparkers are all connected in series. To operate this system, both the white button opening the magnet valve is pushed and the button operating the sparker — the former causing the opening of the gas way, and the latter causing the generation of a spark at the lamps and the ignition of the gas. To extinguish, it is only necessary, of course, to close the magnet valve. In making this type of installation, all the wiring in the secondary or ignition circuit must be carefully insulated and all the burners carry insulating nipples.

The second system employs the magnet valve and a filament igniter. This filament igniter consists essentially of non-conducting body with binding posts and a short filament of a platinum alloy. The operation of this device depends on the heating of this alloy by the passage of an electric current to the temperature at which catalytic action takes place, about 500 degrees F., from which point

this catalytic action causes the filament to be heated, by the stream of gas, to the kindling temperature of the gaseous mixture, about 1500 degrees F., at which point the ignition of the gases takes place. The method of installation on one burner is as follows:

From the source of electrical energy, storage battery, dry cells, or motor generator set, one wire is run direct to the fixture and grounded on it at a point below the insulating joint, which is placed between the fixture and the ceiling drop or side bracket gas outlet — from the other pole of this source a connection is run to the filament on the lamp, and from the other binding post of the filament to the white or opening binding post of the magnet valve. From the black binding post of this valve a connection is then run back to the black button of the switch, thus completing the circuit. In other words, the filament and magnet valve are connected in series through the opening side of the switch, and on the other side the closing side of the switch and magnet valve are in series, the ground wire on the fixture furnishing a common return. To operate this system, therefore, all that is needed is to press the white button which opens the valve, actuates the filament, and lights the lamp, and a pressure of the black button closes the magnet valve and extinguishes the lamp. A number of lamps may be connected to the same switch, the method of connection being the same as in the case of a single burner.

This system has many advantages, some of which are: the use of a single two button switch, small amount of electrical energy needed for operation, positive action, unlimited number of combinations of ignition and extinguishing possible, and the impossibility of turning on the gas to a burner or fixture when ignition would not take place due to a faulty filament, since in that case the magnet valve would not operate. Past experience has shown that this system can be operated at slight expense, and that by carrying the wiring for ignition in conduits in connection with call-bell wires, telephone wires, etc., the compactness is very complete and extremely practical. By the use of a master switch and a revolving contact, similar to that used in flashing signs, the ignition and extinguishing of a large installation, comprising many fixtures, can be made absolutely automatic and extremely rapid in operation."

The development of fixtures for gas lighting has followed along the general lines of progress for electric fixtures, and there are now available many types of gas lighting fixtures for direct, indirect, and semi-indirect lighting. Figs. LV and LVII show types of such gas fixtures used by the gas company in New York City; Fig. LV shows a fixture containing one standard reflex lamp consuming about 3½ cubic feet of gas per hour at a pres-



Fig. LV.



Fig. LVI. Night View of Exhibition Floor, Consolidated Gas Company, New York City.

THE above illustration shows a night view of an illumination provided entirely by gas and where direct and "semi-indirect" lighting fixtures are used. The lights about the columns are lighted and extinguished by push buttons after the fashion of electric lamps.



Fig. LVII.

sure of $2\frac{1}{2}$ inches. The spherical globe on this fixture is open only at the neck. Fig. LVII shows a fixture equipped with 12 junior reflex gas burners, having a total consumption of 18 cubic feet per hour at $2\frac{1}{2}$ -inch pressure. Fig. LVIII shows a 6-cluster gas fixture with the individual burners supported by chains. The lighting and extinguishing of the gas in these lamps is controlled from a distance. Fig. LIX shows an indirect lighting fixture containing three upright burners with standard mantles, hidden from view and consuming $11\frac{1}{2}$ cubic feet of gas per hour at a pressure of $2\frac{1}{2}$ inches. The interior of the opaque bowl is finished in a special white enamel. Fig. LX shows a recently designed high power semi-indirect lighting fixture, having a 14-inch translucent bowl and a reflex lamp. The consumption of gas is $8\frac{3}{4}$ cubic feet per hour at a pressure of $2\frac{1}{2}$ inches. The mean spherical candle power of the lamp, equipped as shown in the illustration, is 173.



Fig. LVIII.

Other types of semi-indirect gas lighting fixtures are shown in Figs. LXI and LXII.

Pendant gas lighting fixtures are usually equipped with pipe stem suspension, but with the growing introduction of indirect and semi-indirect lighting units, the chain suspension is coming into more extensive use. For fixtures with chain suspension exclusively the gas may be piped to the burner either directly through the chain, which is the usual way, or by means of a thin flexible tube attached to the chain. This tube may be made quite as inconspicuous as is the wiring of the average electric chain suspension fixture.

With modern improvements in efficiency and life of mantle gas burners, in quality of the light, in push button and automatic control, and in fixture design, there is a vast field for the modernization of existing gas installations, to say nothing of the equipment of new buildings.



Fig. LIX.



Fig. LX.



Fig. LXI.



Fig. LXII.

OFFICES, EXHIBITION ROOMS AND BANKING ROOMS.



Fig. LXIII. Direct Lighting Installation in Clerical Offices.



Fig. LXIV. Semi-Indirect Lighting Installation in Private Office.

OFFICES OF CARNEGIE STEEL COMPANY, PITTSBURGH, PA.

*I*N the above direct lighting installation in a large office no desk lamps are required, the general illumination from the ceiling pendants being sufficient for all working purposes. The units are spaced on approximately 9 ft. centers and an investigation in the room has shown that the resultant illumination is much more satisfactory when the lamps are hung high, as indicated in the picture, than when the lamps are hung low. The reflectors are of light density opal glass.

*T*HE illumination in the room illustrated below is obtained by tungsten lamps enclosed in diffusing shades open at the top to permit a considerable percentage of the light to reach the ceiling directly. This "semi-indirect" lighting installation can be converted into a direct lighting installation by mounting the diffusing shades with the opening facing the floor instead of the ceiling. The shades are specially designed for this convertible feature, and are 17 inches in diameter and 8½ inches deep. Each shade houses a 250-watt lamp. Data for the entire building are as follows:

Total Floor Area	76,800 sq. ft.
Average Watts per square foot	1.4
Average Foot-candles	4 to 6

*I*N the installation illustrated above the fixtures are arranged slightly closer than at centers of equal rectangles which prevents the upper portion of the walls at the ends of a narrow room from receiving direct light from the lamp bulb. Two 250 watt tungsten lamps were found sufficient for the lighting of this room. Data for this room are as follows:

Ceiling Height	12 ft.
Area of Room	480 sq. ft.
Watts, 500	Watts per square foot, 1.04
Average Foot-candles	3.5
Ceiling Tint	Light Cream
Wall Tint	Dark Buff
Distance to Ceiling	3 ft. 4 ins.

*T*HE glass bowls of the type shown in the illustration below are made deep enough to sufficiently hide the lamp bulb either horizontally or vertically placed. The glass is sufficiently dense to prevent uneven illumination of the bowl which has been found to be a bad fault when using lamps that necessarily must be clustered and placed close to the interior surface. The design is also such as to minimize ceiling shadows caused by the supporting chains.



Fig. LXV. Night View of Exhibition Room, Buffalo General Electric Company.



Fig. LXVI. Semi-Indirect Lighting Installation, First National Bank, Chicago, Ill.

IN the illustration of the banking room at the right direct lighting through diffusing glass plates and semi-indirect lighting are combined. On the ceiling are mounted direct lighting units, the lamps of which are enclosed in diffusing globes. Around the inner edge of the light well is a line of diffusing plates and outlining the ventilating register boxes on the ceiling are diffusing glass troughs of special design.

The illumination in the banking room shown below at the left is carried out by lamps enclosed in prismatic glass spheres suspended from the ceiling. This form of direct lighting



Fig. LXVII. Direct and Semi-Indirect Lighting Installation in Union Trust Company Building, Pittsburgh, Pa.

installation has the advantage of sufficiently diffusing the light and at the same time completely hiding the objectional direct view of the lamp itself.

The illustration below at the right shows a modern banking room illuminated by indirect lighting in which the fixtures have been designed to harmonize with the architectural treatment of the ceiling and columns. There are seven large fixtures on the upper ceiling of the room shown, and each fixture contains 12 100-watt lamps. There are eleven fixtures under the mezzanine floor. Each fixture is equipped with 4 60-watt lamps.



Fig. LXVIII. Direct Lighting from Lamps Enclosed in Prismatic Diffusing Glass Spheres.



Fig. LXIX. Indirect Lighting Installation in First National Bank, Denver, Colo.

IN conclusion the writer desires to acknowledge the kind and valuable co-operation of the manufacturing interests in supplying information, data of tests, and photographs relating to lighting installations. The limits of the article have made it impossible to use all of the illustrations and data submitted. Grateful acknowledgment is made of contributions from Messrs. Thos. Scofield, Engineer, Consolidated Gas Co., New York City; A. D. Curtis, President, and H. B. Wheeler, Illuminating Engineer, National

X-Ray Reflector Co., Chicago; W. D'A. Ryan, Illuminating Engineer, General Electric Co., Schenectady; V. R. Lansingh, Gen. Mgr. Holophane Works, Cleveland; Geo. S. Barrows, Illuminating Engineer, United Gas Improvement Co., Philadelphia; S. G. Hibben, Illuminating Engineer, Macbeth-Evans Glass Co., Pittsburgh; R. F. Pierce, Illuminating Engineer, Welsbach Co., Gloucester, N. J.; and W. S. Kilmer, Illuminating Engineer, H. W. Johns-Manville Co., New York.

The Business Side of an Architect's Office.

THE OFFICE OF GEORGE B. POST & SONS.

By D. EVERETT WAID.

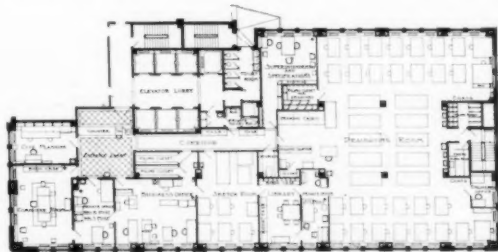
THE late George B. Post will live in the memory of architects as a giant in the profession. Some men are regarded by their fellows as artists, others as promoters and constructors, who have failed to command a high degree of respect as designers. Mr. Post possessed that rarely symmetrical development of abilities which won him recognition as an all-round architect. He could analyze engineering problems and study the structural suitability of building materials. He could talk to the directors of a financial corporation on the economic and investment aspects of their project, and he could find time even when doing millions of dollars' worth of work to render a water color competition drawing with his own hand. The mention of his name recalls a list of important buildings which are notable as to design and at the same time reflect the exceptional structural and executive control exercised directly by the architect. Hence it is probable that many of the profession will be interested in the office of George B. Post & Sons, which carries the traditions of the old office, in which many present-day practising architects served their time, even though Mr. Post, Senior, had to a large extent retired from active work three years before his death.

The volume of work passing through this office is very large and demands corresponding space and a large organization. The printed forms used in the conduct of the office are many, and express the "follow-through" business methods which characterize the firm. Several of these forms are reproduced on the next page, and the following notes are intended to explain their uses.

Memo-Record. One of the most important documents is familiarly referred to as the "Memo-Record." It does not follow any rigid form, but is simply a series of concise notes made up from interviews with, or



Entrance Lobby.



Plan.



Committee or Reception Room.

letters of instruction from, clients, type-written in triplicate. The original black copy remains in the outer office, a carbon copy goes to the superintendent, and a red copy to the drafting room for the information and guidance of all concerned. These "Memo-Record" notes are referred to by draftsmen and specification writers, and may be the origin of "Work Slips" and "Change Slips."

*Record Cards — History of Drawings.**

Record cards shall be filled in as to name of building and job number for each new job, and a number of cards placed on file in numerical sequence for record of prints issued or loaned.

The original drawings or sketches should not be loaned, unless office copies are made, without special instructions from a member of the firm.

Blue guide cards are to contain names and commission numbers of the buildings. Salmon guides are to contain the names of constructive materials used in the building. Buff guides indicate the general character of drawings. White cards are to contain the history and location of drawings made in this office.

These cards are arranged as shown in Fig. 9 for the subject and title of drawing to be type-written, with its scale, number of drawer in which it is kept, a record of the number of copies issued, and to whom, with the dates for same, together with a list of other drawings to which it refers. Buff cards are similarly arranged to give the history of drawings made outside the office.

*Order for Prints.**

The printer's supply "Order Blank" shall be filled in according to form and a carbon copy kept in the book on file in issuing department.

When the prints are received, the size of each print shall be carefully noted on the space on the duplicate order blank, by which the bills when rendered shall be

*Quoted from office instructions.

1. Credit Memo.

2. Change Slip.

3. Order for Extra Work.

4. Report Blank.

5. Superintendent's Report.

6. Form of Proposal.

7. Typical Drawing Title.

8. Loan Slip.

9. Record Card.

10. Drawing Received Slip.

11. Sample Received Slip.

12. Form of Certificate.

13. Issuing Blank.

14. Work Slip.

checked, after which the blanks are filed in the issuing department for at least one year.

*Loaning Drawings.** "Loan Slips" (shown in Fig. 8) shall be filled in according to form and a carbon copy kept in the book. The yellow "Memo. Return Tag" shall be placed on the upper left corner of each print loaned separately, or on the first of a set of prints bound together.

The loose slip is then attached to the record cards for the drawings of which prints have been loaned, the record of which is then typewritten upon the record cards and the card filed in the index case and the loan slip filed in the front office. When drawings are returned, the loan slips should both be filled in according to form.

An office copy of every print loaned for estimate, upon which a contract is to be based, must be made at the same time and carefully wrapped up and marked and filed in the drafting room. If several sets are loaned for estimate, one of these, when returned, may become an office copy.

If the contractor to whom the contract is awarded has returned his set, it is then "issued" to him as the contract set of drawings (usually the contractor prefers to use the copy loaned him for estimate).

*"Issuing Blanks"** (shown in Fig. 13) should be filled in according to form, the blank then attached to the record card for these drawings, a record of which is then typewritten on the card and filed in the index case, and the issuing blank filed in the front office. A drawing may be recalled and re-issued with revisions, etc., in which cases a new blank is filled in and filed as before; the old blank remaining as a record.



The Desk and particular Chair which Mr. Post used for many years as he left it shortly before his death.

*Drawings Received.** "Drawing Received Slips" (shown in Fig. 10) are to be filled in according to form and a carbon kept in the book. The drawings or prints received should be stamped on the back of the lower left-hand corner, with the "Receiving Stamp" and "D.R.S. number" filled in according to form. The loose slip is attached to the drawings which are sent to the drafting room for examination and the result noted thereon.

The loose slip is then filled in further as to returning and filing of the drawings, and then attached to the letter and forwarded to the front office, giving the data for answering the letter submitted with the drawings.

The loose slip is next filled in as to the notifications to the submitter and returned to the issuing desk, the carbon copy in the book is made to agree, and the loose slip is filed.

"Sample Received Slips" (shown in Fig. 11) should be filled in according to form (with no duplicate copy). For each new job a number of sample slips are stamped and kept in numerical sequence in a box on the issuing desk. Tags should be pasted on the back of the samples and filled in as to material, submitter, date, with "S.R.S. number." These slips are then attached to the letter accompanying the sample and records made after the manner of "Drawing Received Slips."

Other forms in constant use are the "Change Slip" (Fig. 2), which originates usually either in the drafting room or in the superintendent's office, and the "Work Slip" (Fig. 14), a follow-up card which is considered one of the most important instruments of the business system in the office.

*Quoted from office instructions.



In the Specification Room.



Corner of the Library.



Drafting Room.

EDITORIAL COMMENT AND NOTES FOR THE MONTH



ARCHITECTS shoulder a grave responsibility in the matter of fire prevention. All over the country members of the profession have come to realize this and are exerting their powerful influence in co-operation with those who have made the subject a specialty. A special committee has been organized in the city of New York, composed of architects and members of the National Fire Protection Association. In a recent report this committee declares that the "existing constitutional prerogative of the property owner" is one of the serious obstacles in the campaign for fire prevention. The report continues:

"The architects of America can and should take the initiative responsibility to the limit of their influence with clients by advising that reasonable fire resisting methods of construction be observed, not alone upon their merits, but because of the ultimate economy that must result by anticipating a tidal wave in the form of a sudden popular demand for stringent laws that will fix the standard so high as to require costly alteration in the best, and prohibit the occupation of all buildings under the ban of condemnation issued by duly constituted authorities. The process of evolution is ever active, and it is only a matter of time when landlords will be obliged to submit to humanitarian equalization. Only justice is desired, but do not force it. Let us advise ways and means whereby a composite perspective may be voluntarily accepted by the owner as an inevitable matter of course."

IT IS gratifying that so many of the designs submitted in our recent competition for a small brick house—a selection of which will be published in *THE BRICK-BUILDER* for March—should possess many of the characteristics which differentiate the home from the house.

While these designs will show an exceptionally virile grasp of those elements which characterize the better American homes of moderate cost, a mere drawing fulfilling arbitrary conditions laid down in a program, no matter how effective or how beautiful the composition, cannot be said to represent a home. The perfect home can only be evolved by an architect who is in direct touch with his client and who has imbibed something of that client's personality *before* he makes his design. The value of the presentation of the designs is but the first step. It brings together the architect who creates and the client who requires the expression of a particular idea.

The design of a house is much more than the mere arrangement of several rooms fulfilling various functions or of the disposition of architectural features to form an attractive and pleasing exterior, either in a formal or picturesque manner. Something more than this is needed to render a house a home. In order to be called a "home," it must be a house consonant with the habits and mode of living of the man who resides beneath its roof and a definite expression of his individuality.

HOW discouraging it is to be constantly confronted with the "nothing under the sun new" theory.

How unfortunate that the wings of modern endeavor should be clipped by so-called savants, who continually bob up with the report that the *ne plus ultra* of everything was attained when the world was in *statu pupillari*. Did it encourage Watt to be told that the ancients were past-masters in the use of steam? Did Stevenson work with renewed vigor in his attempt to harness steam when he was informed that sometime B. C. steam, generated beneath the altar fires, was used to open the temple gates? No doubt he felt more chagrin, from the knowledge that he had been anticipated two thousand years, than pleasure in the explanation of what seemed a miracle.

We have, almost in our own day, another example of this muckraking of the past. Hardly had Bouscareau contrived what we had supposed was the first suspension bridge, than along comes a mildewed antiquary, with the news that "flying bridges were common in China in the days of Confucius." We are expecting daily that some one will discover that aeroplanes were as common in the Pleistocene age as are London omnibuses.

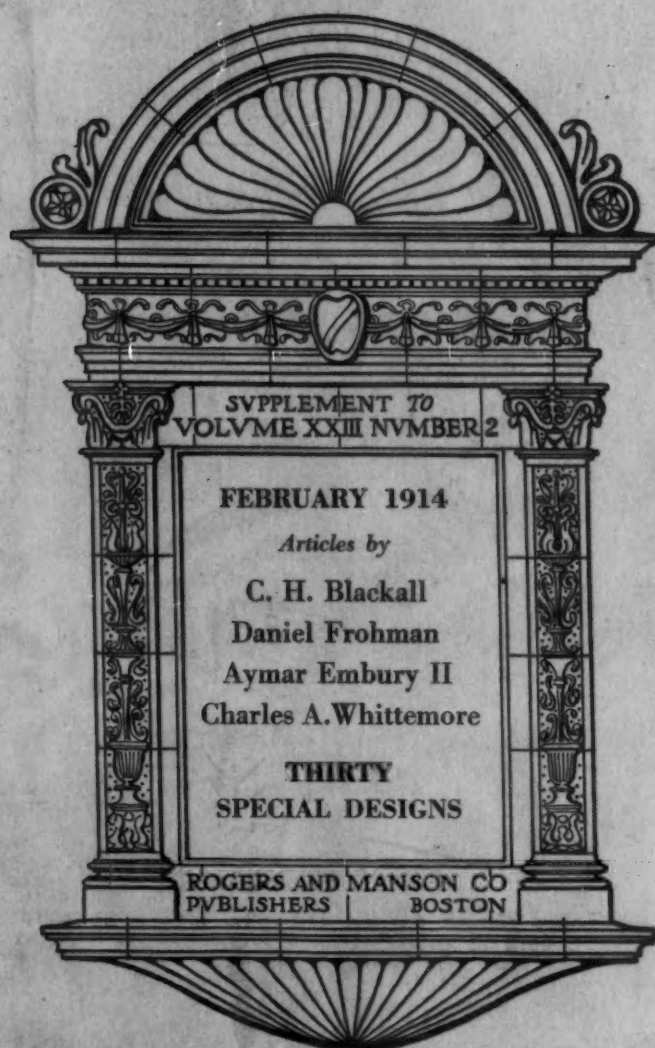
We for our part believe neither in the fact nor in the policy of the elevation of ancestors. We see the bad effect of this religion in the Chinese people of to-day. It is a pleasure to note, however, that we are progressing in spite of these raconteurs. For example, consider architecture. Time was when we felt bound to the three orders of Greece or the five orders of Rome. Indeed, even to-day do we find most of capitols and railroad stations Doric, our churches and prisons Gothic, and our residences composite, *very* composite. But quietly, modestly, persistently, we are developing a new order. Is it the sky-scraper? No! Is it the subway? No! It is the eggandart!

It is true that some architects have already employed the egg-and-dart in the treatment of their objects, but only to a limited extent. It is now used only on cornices, columns, pilasters, frames, mouldings, architraves, panels, wainscot, mullions, lintels, sills, jambs, baseboards, etc. But in no distant future we will have the pure egg-and-dart. No longer will this beautiful and rare design be violated by being placed in proximity to spiral volute, astragal, cartouche, or acanthus. The building of the future, such as no ancestor might boast of, stands revealed. From top to bottom, within and without, it will be covered with a tracery of eggandart that will delight every architectural eye that beholds it. — *Contributed.*

In an article in the January, 1914, issue of *THE BRICK-BUILDER* treating of the drawings of Mr. O. R. Eggers, credit for the design of the U. S. Post Office, Denver, Colo., and for the Washington Armory, was given to Tracy & Swartwout, architects, when as a matter of fact the work was that of the firm of Tracy, Swartwout & Litchfield.

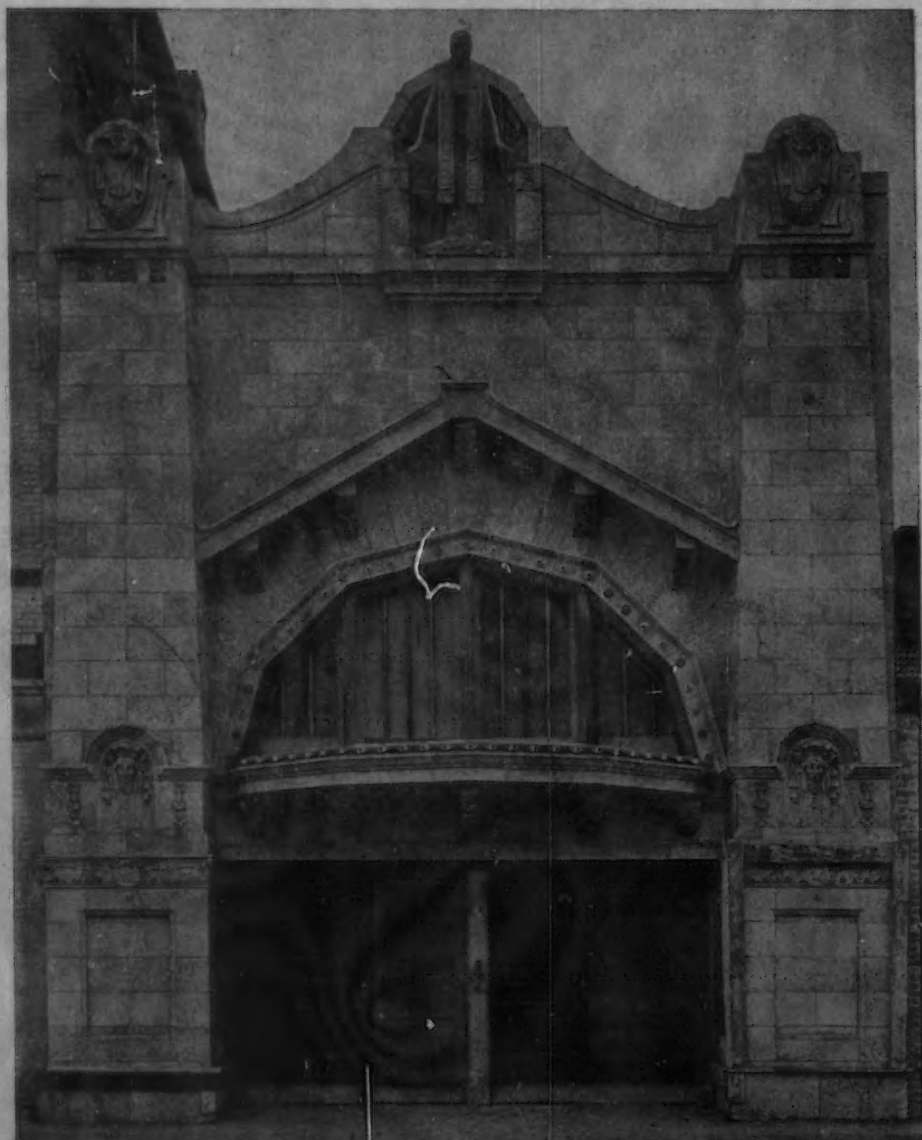
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THE BRICKBUILDER ARCHITECTURAL TERRA COTTA NUMBER



MOVING PICTURE THEATRES

THE NORTHWESTERN TERRA COTTA CO.



GILES THEATRE, CHICAGO, ILL.
W. W. CLAY, Architect

THE facade of this theatre is built of "NORWETA" Granite Terra Cotta, made and set by The Northwestern Terra Cotta Co. The particular shade used is a dusky red granite terra cotta and the design, material and color give a very harmonious effect.

This building illustrates the advantage of having architectural terra cotta set by manufacturers, as exceedingly good work is often spoiled in the field by careless or inexperienced setters.

THE NORTHWESTERN TERRA COTTA CO. have a force of skilled men who give an individuality to work set up by them.

The Northwestern Terra Cotta Co.
CHICAGO, ILLINOIS

225-225-CLAY BOVERN AVE CHICAGO ILL

THE BRICKVILDER

SUPPLEMENT TO
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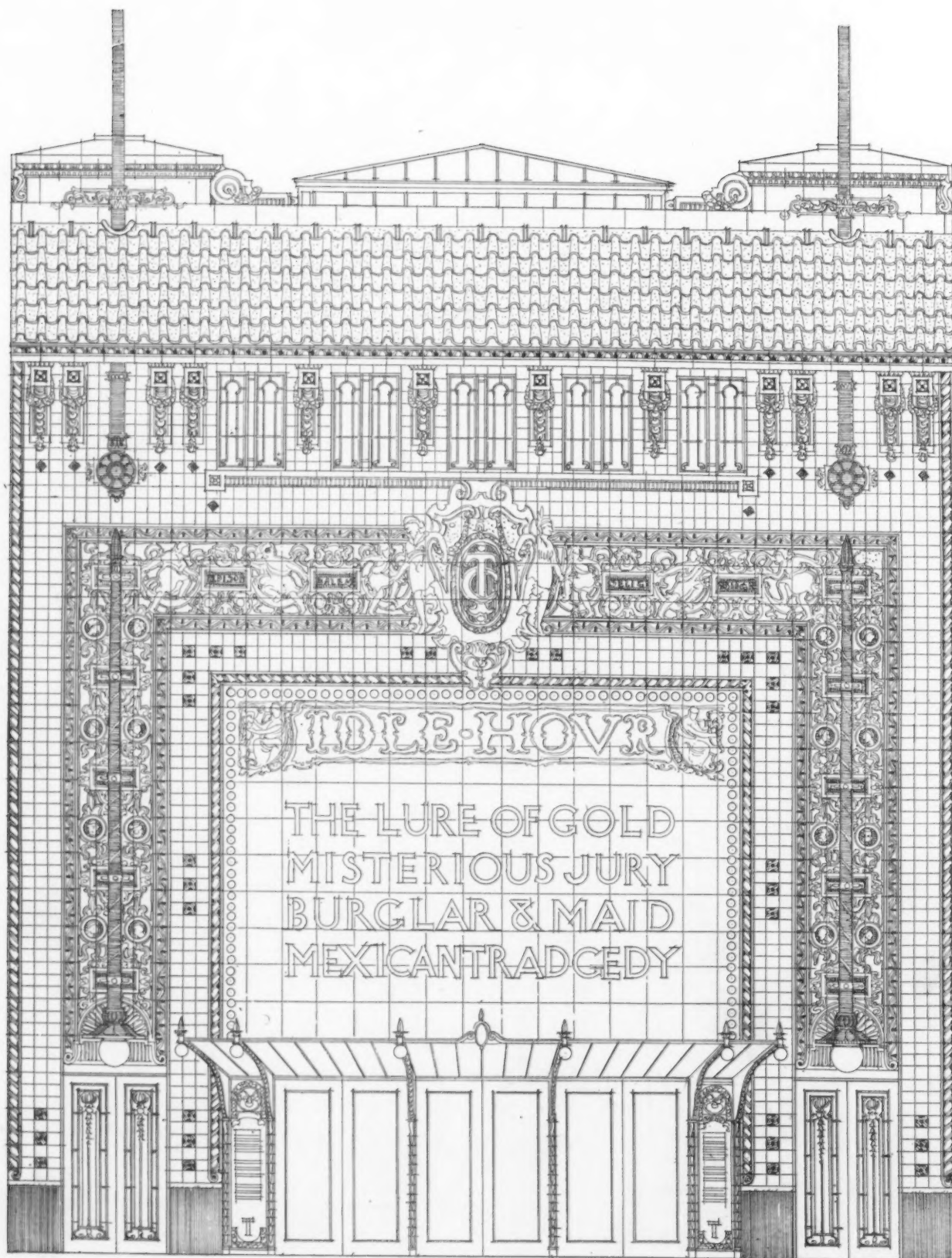
VOLUME XXIII
NUMBER 2

ARCHITECTURAL TERRA COTTA NUMBER MOVING PICTURE THEATRES

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A MOVING PICTURE THEATRE

FIRST PRIZE DESIGN—THE BRICKBUILDER'S ARCHITECTURAL TERRA COTTA COMPETITION, 1914
 SUBMITTED BY LOUIS FENTNOR AND ROBERT PALLESEN, NEW YORK, N. Y.

THE BRICKBILDER

VOLUME XXIII

SUPPLEMENT TO FEBRUARY, 1914

NUMBER 2

1 The Moving Picture and its Place in American Drama.

By DANIEL FROHMAN.

Theatrical Manager and Producer.

THE "movies" (the quotation marks might well be omitted, as the constant use of the word has made it a part of our vocabulary) are the modern miracle-plays, the drama of the people and for the people.

How wonderful and ingenious they are, and in many ways how well they serve both for entertainment and instruction.

As a nation, Americans are great theatre-goers. Since the advent of moving pictures the national habit has been marvelously augmented. No form of amusement has ever gained such rapid and apparently stable popularity as the moving picture. Moving picture theatres spring up like mushrooms over night.

The drama in America, unlike Germany, has no inherent part in our educational system, because children are not brought up in the belief that amusement in the theatre means anything else than amusement in its most superficial sense. But in Germany, literature is so much a part of the stage and the stage is so much a part of literature that the schools and universities are in close touch with the theatre. Now the moving picture in America will some day serve to vivify the better class drama in our schools and will help to create a taste which will be healthy for the theatre itself. Plays are now being studied in colleges, as, in fact, they always have been; but there are very few people gifted with sufficient imagination to make visible to themselves the pictorial quality of what they are reading. The moving picture will make more lucid the reading of "Hamlet" or "Julius Cæsar," of "Romeo and Juliet" or "Coriolanus." Better than the stage can present it, the moving picture will bring within the reach of the masses the great events of the world and all the rich possibility of the great pageants. Where on any stage could one have witnessed the brilliancy of the Durbar or of the coronation of King George V? While there is no thought in my mind that the picture will ever supplant the greatest of all arts—that of acting—it will reach people who otherwise would be untouched. Even though the film cannot preserve the warm personality of the actor, it can fix for all time some semblance of the actor's technic, manner, and appearance. Who would not give much to see the visualized art of Edwin Booth or of Richard Mansfield?

We can safely say that the buildings which house this form of amusement have become permanent institutions in the United States. Already 20,000 picture theatres are being operated in the country at large, and the investment in the industry is given by the statistics as between \$80,000,000 and \$200,000,000. These same statistics give the average daily attendance as 5,000,000 people.

In general, however, moving picture theatres are dedicated to a form of theatrical amusement of the lightest sort—an amusement so modern and so newly developed that it was practically unheard of in the United States ten years ago. It is interesting in this respect to give an advertisement which appeared in England exactly one hundred and one years ago.

"At the Duke of Marlborough's Head in Fleetstreet, is now to be seen a new Invented Machine, composed of five curious Pictures, with Moving Figures, representing the History of the Heathen Gods, which move as artificially as if Living: the like not seen before in Europe. The whole contains near an hundred Figures, besides Ships, Beasts, Fish, Fowl and other embellishments, some near a foot in height; all which have their respective and peculiar Motions, their very

THE BRICKVILDER.

Heads, Legs, and Arms, Hands and Fingers, artificially moving to what they perform, and setting one Foot before another like Living Creatures, in such a manner that nothing but Nature can excel it. It will continue to be seen every Day from 10 in the Morning 'till 10 at Night."

The moving pictures of 1812, it must be admitted, were different in mechanism and extent from those which play so large a part in the life of 1914.

There is much to be said for an amusement which a poor man can have for ten cents. The galleries of the regular theatre, that portion of the house from which a large part of the profit is derived, are being emptied, not because of the price of the seats, but because the average theatre-goer has always objected to paying a disproportionate price for a poor seat and a poor play together, when for ten or twenty-five cents he could sit down stairs in a moving picture house and get something in which he may be really interested. No manager can afford to ignore the fact that his galleries are being emptied by the moving picture; no dramatist will succeed who deafens himself to the cry of the gallery god. It is worth while for both of them to study the moving picture situation and see wherein it has its appeal. The people, the great public for whom managers strive, obeying the mob spirit, want action in their amusement. They do not get it in the problem dramas, in the psychological studies put upon the stage; they do get it on the screen.

Another advantage of the moving picture is to supplement the imagination of the audience. No acted play ever begins at the beginning; there are many antecedent events necessary which take place in dialogue and are not always wholly grasped. Those antecedent events the moving picture is able to vivify, to make an inherent part of the story, by commencing at the first stage of interest. In putting Shakespeare's plays into moving pictures we begin with the antecedent events—events which are explained in long passages of prose or poetry when the drama is read. But the moving picture abhors the lack of explanation as surely as nature abhors a vacuum. Everything must be shown. The text is always illustrated. In "Julius Cæsar," when Mark Antony describes how he, among others, thrice offered Cæsar a kingly crown "which he did thrice refuse," we, in making the film of the play, actually show the scene, with all of its mob movement and all of its craftiness, and so start the cause of action and the motive of the conspirators. The "Hamlet" film begins long before the text begins.

The public often claims that by putting Shakespeare on the moving picture screen we are destroying Shakespeare. But that is not so. We are, in truth, proving the value of literature, by showing the vitality of its action and of its outward emotion, and the perfect physical structure of his works. Shakespeare's variety is no better seen than in the moving picture. There is in him something for all men.

The camera adapts itself to the mental demands of audiences. It is not so easy to have a multiple number of scenes on the stage when a play is given, but on the screen may be flashed back and forth any number of pictures to explain what a man thinks or what he sees.

All audiences, young and old, want stories, and so the moving picture takes its place as a rapidly unfolding story-telling entertainment. The moving picture theatre is where all obtain pleasure—pleasure often united with instruction.

Madame Sarah Bernhardt, who is enthusiastic about the moving picture, wrote to us after seeing the films of herself in the part of "Queen Elizabeth": "It is with a feeling of gratitude that I turn to the God of Genius, to offer him prayer for the wonderful miracle that he has brought about whereby he hath given man power to hand down to posterity the greatest success of my career, 'Queen Elizabeth.' It is a great joy for me to know that my masterpiece is within reach of all the people throughout the universe, and I hope it will be appreciated before and after I am gone."

The moving picture has to an almost certain extent annihilated the entire mutability of the actress or actor. When James K. Hackett saw himself in the "Prisoner of Zenda," he exclaimed, "There is no death!" and indeed that is the condition which has been brought about by the "wonderful miracle" which man now has in his power to perpetuate.

It would seem that a moving picture discloses more nearly the essentials of good drama than the acted play, except for the fact that the stage plays, as acted, will always maintain their supreme hold on the public because we have the living, healthy embodiment of the character represented by means of the personality of the actor. In these human essentials the picture play is lacking. On the other hand it does reveal vividly a story of constant movement and action so dear to the amusement loving public.

The Brickbilder

Annual Architectural Terra Cotta Competition.

PROBLEM: A MOVING PICTURE THEATRE.

FIRST PRIZE, \$500.

SECOND PRIZE, \$250.

HONORABLE MENTIONS.

THIRD PRIZE, \$150.

FOURTH PRIZE, \$100.

PROGRAM.

THE problem is a Moving Picture Theatre, two stories high, and a third floor for business purposes, to be located in any city or large town in the United States. The building lot has a frontage of 50 feet and is 100 feet deep, bounded on either side and at the rear by existing buildings. The building is to occupy the entire lot. The land is level. The auditorium is to seat 600 persons, distributed — 450 in orchestra and 150 in the balcony. Only one balcony is to be provided.

The first floor is to provide for the orchestra and orchestra pit, platform, lobby and usual accessories, also entrance to second and third stories so arranged as to be independent of theatre lobby. Two small stores may or may not, at the discretion of the designer, be located on this floor at front of building.

The balcony floor is to provide a foyer, operating room for apparatus and rewinding room, and such other disposition of balance of space as may seem desirable to the designer.

The third floor is to be used either for business purposes or a hall.

The plans must show clearly and fully the location and width of all exits, passageways, stairs, fire-escapes, aisles, arrangement of seats, the location of the enclosure for the motion picture light and machinery, etc. On the ground floor plan show outlet from all exits. The sight lines should be laid out in section so that every seat shall command an unobstructed view of the platform and moving picture screen.

While it is recognized that laws and ordinances pertaining to this class of building differ in various parts of the country, certain fixed requirements of plan must be incorporated in the solution of this problem, viz., at least two separate exits must be provided on the main floor, one of which shall be in the front and the other the rear (rear meaning at the platform end), both leading to unobstructed outlets on the street. No exit shall be less than 5 feet in width, and there shall be a main exit not less than 10 feet in total width. An open court or fireproof passage must be provided from rear exit to the street front at least 6 feet wide. The total exit facilities must amount to 30 feet. No aisle should be less than 3 feet in the clear. Entrance to and exit from balcony must not lead to the main floor of theatre. There must be no circular or winding staircases. The total width of stairs from balcony shall not be less than 8 feet in the clear. Two staircases of 4 feet each will answer. Balcony must provide for at least one line of fire-escape leading to street or court, without re-entering the theatre. No foyer is to be less than 6 feet, exclusive of stairs. It is not necessary to consider daylight illumination for the interior.

The street façade of the building and the side walls of the lobby are to be designed entirely in Architectural Terra Cotta. It is advocated that colored terra cotta be employed; at least a portion of the walls should be so treated. Provision must be made for attractive bulletin boards at either side of entrance, designed to be executed in terra cotta. Other display signs may be incorporated in the design of the façade at discretion of designer.

The purpose of this Competition is to encourage a wider study of Architectural Terra Cotta as a building material. It is felt that the adaptability of the material to this particular problem offers the designer special opportunity to show his ingenuity in the development or modification of a given style. It is the intention that the design should be in reason with the commercial requirements of a building of this class. The following points will be considered in judging the designs:

A. The general excellence and originality of the design and its adaptability to the prescribed material. B. The intelligence shown in the constructive use of Architectural Terra Cotta. C. Excellence of plan.

DRAWING REQUIRED. (There is to be but one.)

On a sheet of unmounted white paper — very thin paper or cardboard is prohibited — measuring exactly 36 x 27 inches, with strong border lines drawn 1½ inches from edges, giving a space inside the border lines of 33 x 24 inches, show:

The street elevation with section through front wall at a scale of 4 feet to the inch.

The longitudinal section at a scale of 8 feet to the inch. (A complete drawing from floor of basement through roof.)

The first and balcony floor plans at a scale of 16 feet to the inch.

Elevation of one side of lobby showing design in terra cotta at a scale of 4 feet to the inch.

A sufficient number of exterior details drawn at a scale of one-half inch to the foot to completely fill remainder of sheet.

The details should indicate in a general way the jointing of the terra cotta and the sizes of the blocks.

The color scheme is to be indicated either by a key or a series of notes printed on the sheet.

All drawings are to be in black ink without wash or color, except that the walls on the plans and in the sections may be blacked-in or cross-hatched. Graphic scales are to be shown.

Each drawing is to be signed by a nom de plume or device, and accompanying same is to be a sealed envelope with the nom de plume on the exterior and containing the true name and address of the contestant.

The designs will be judged by three or five well-known members of the architectural profession.

The Competition is open to all architects and architectural draftsmen.

The manufacturers of architectural terra cotta are the patrons of this Competition.

Report of the Jury of Award.

THE BRICKBUILDER'S ARCHITECTURAL TERRA COTTA COMPETITION.

A MOVING PICTURE THEATRE.

YOUR jury begs to report that there were some one hundred and eighty-five designs submitted in this competition, and that the general excellence was of an unusually high order. Apparently the criticism in past competitions where the use of architectural terra cotta was called for had good results, as the jury was very much impressed with the intelligent use of the material shown in a very large number of the designs submitted. In fact, some of the most beautiful compositions, as to material, detail, etc., had to be rejected because they were either faulty in plan, lacked the proper character for a moving picture theatre, or took no regard for the interior lot, allowing cornices and other motives to project beyond the property line.

As the primary object of the competition was a study in architectural terra cotta for a particular kind of building, the jury were guided largely by the clauses,

- A. The general excellence and originality of the design and its adaptability to the prescribed material.
- B. The intelligence shown in the constructive use of architectural terra cotta.
- C. Excellence of plan.

which were stated in the program.

Moving picture theatres, and especially the type constructed on an interior lot, are being built in large number throughout the country; this problem is being studied by many architects, and in very few instances are the results highly successful.

The plans generally have to conform to very strict building laws, but the exteriors seldom show real architectural merit, and when they do, almost invariably no consideration is given for the placing of advertising signs, electric night and day display, etc., with the result that the façade is literally covered by an inartistic mass of crude iron braces, wire mesh, ugly lettering and arc lamps. This display of advertising is an absolutely essential matter with the managers of these theatres, and the successful designer is he who so composes his façade as to meet this problem frankly, and make this requirement an actual part of the artistic composition of his building. About the only disappointing feature in connection with the designs submitted was the fact that so few of the competitors solved this very essential and practical consideration, but designed beautiful façades in terra cotta which if constructed would be artistically ruined by the "Advertising Display Sign Co." Unfortunately, prizes and mentions had to be given to some designs which are open to this criticism, but the excellence of the use of terra cotta shown in them, and the fact that further study might solve this problem, guided the judgment.

The First Prize Design deserves its selection, as it fulfils all the requirements of the program, and meets all the practical considerations in a most architectural and artistic way. It has dignity and good taste, is in excellent character, strong in composition, and is a beautiful study in terra cotta. The composition of the sheet is also very successful.

The Second Prize Design has most of the good qualities of the first prize, though the important consideration of display sign advertising is not as well solved. It is also a question whether the vestibule off axis is the best arrangement in plan.

The Third Prize Design is not as successful as the first or second, but it has a charm and refinement of detail, and is a good study in terra cotta. The composition does not entirely arrange.

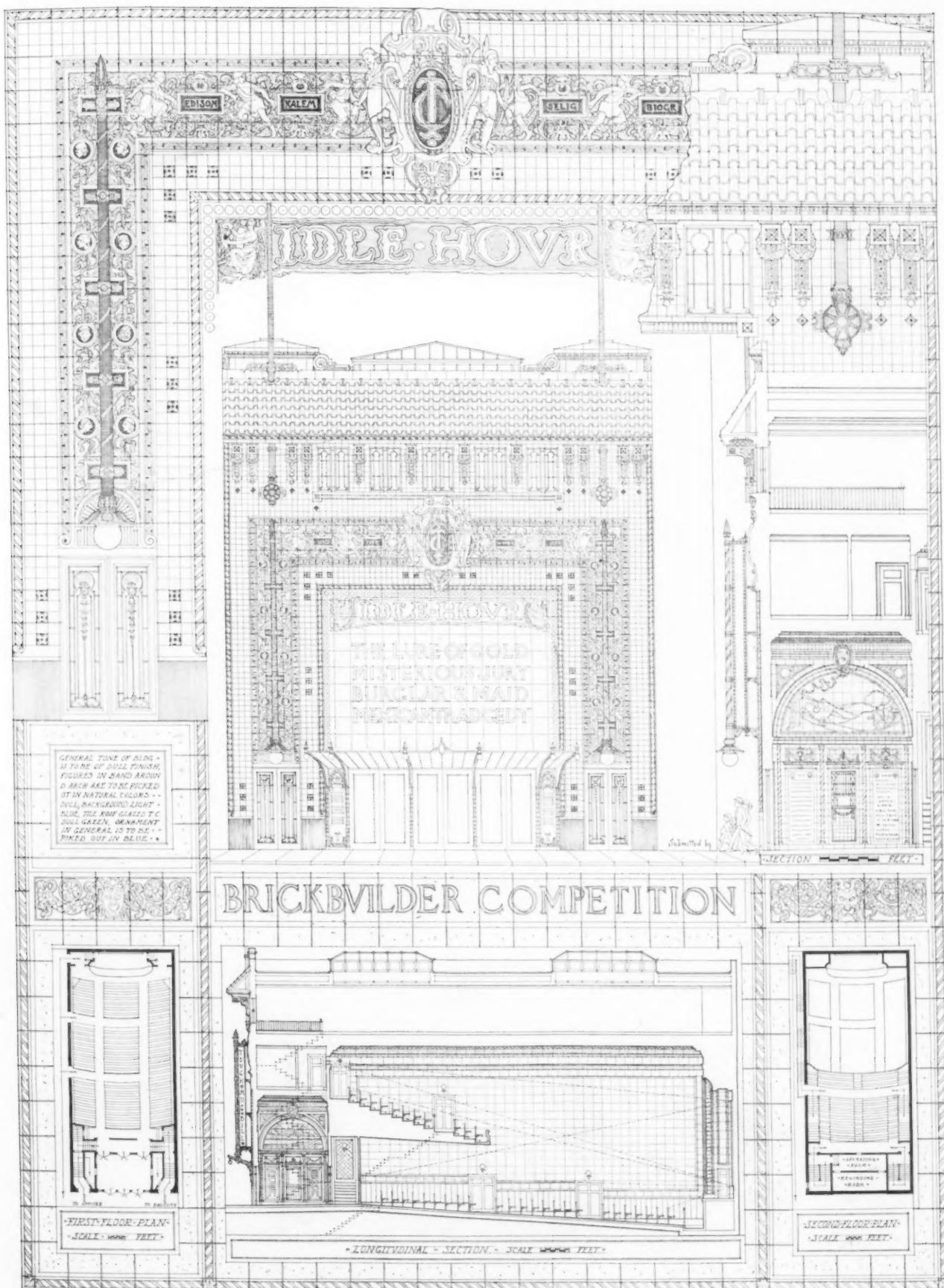
The Fourth Prize Design was considered the best of the flamboyant type submitted. It is truly a design in terra cotta, and the character of the building is unmistakable. In perspective, the crude iron bracing of the sky sign is never attractive. The beauty of the sheet and drawing was very much admired.

The Mention Designs all show a very interesting study in terra cotta, and are of a high standard of excellence throughout. It is a question whether a rejudgment or another jury might not have placed some of them among the prize winners. They are all classified of equal merit.

WINTHROP AMES,
HOWARD GREENLEY,
HARRY CREIGHTON INGALLS,
ALBERT KELSEY,
HUGH TALLANT,
ARTHUR WARE,

} Jury
of
Award.

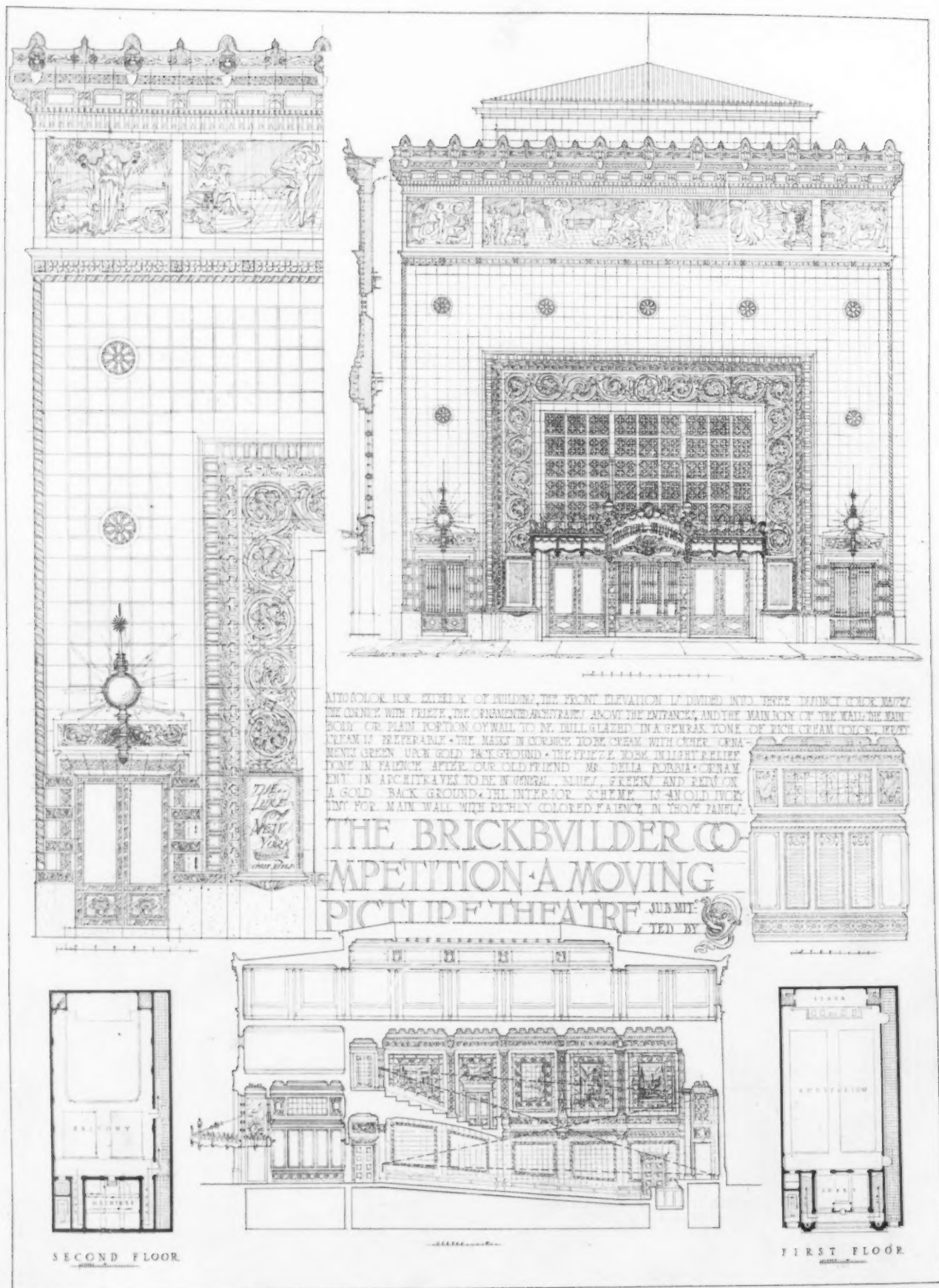
COMPETITION DRAWINGS.



FIRST PRIZE DESIGN

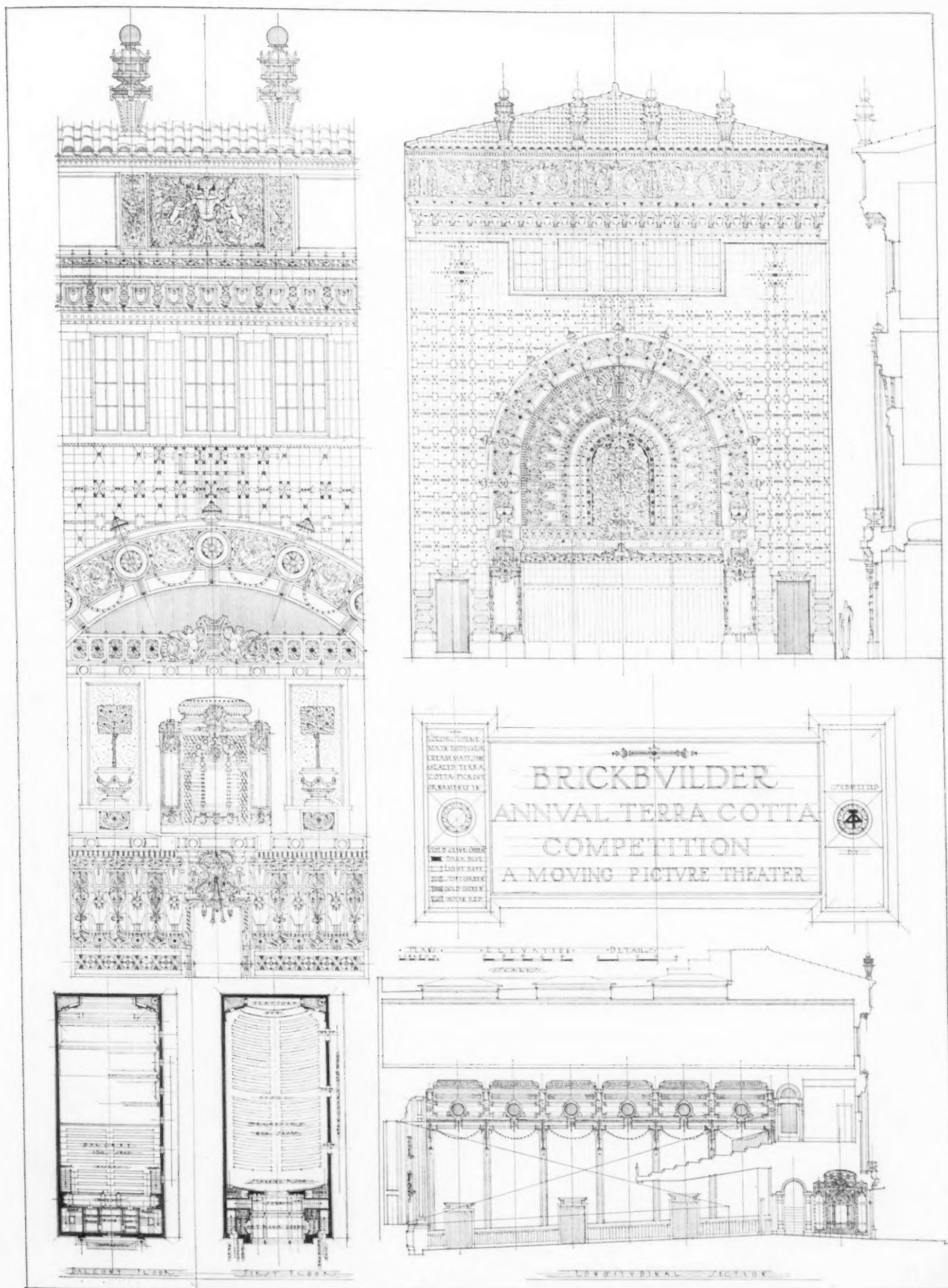
SUBMITTED BY LOUIS FENTNOR AND ROBERT PALLESEN, NEW YORK, N. Y.

THE BRICKBUILDER.



SECOND PRIZE DESIGN
SUBMITTED BY THOMAS B. HERMAN AND DINARDO & BEERSMAN, ALBANY, N. Y.

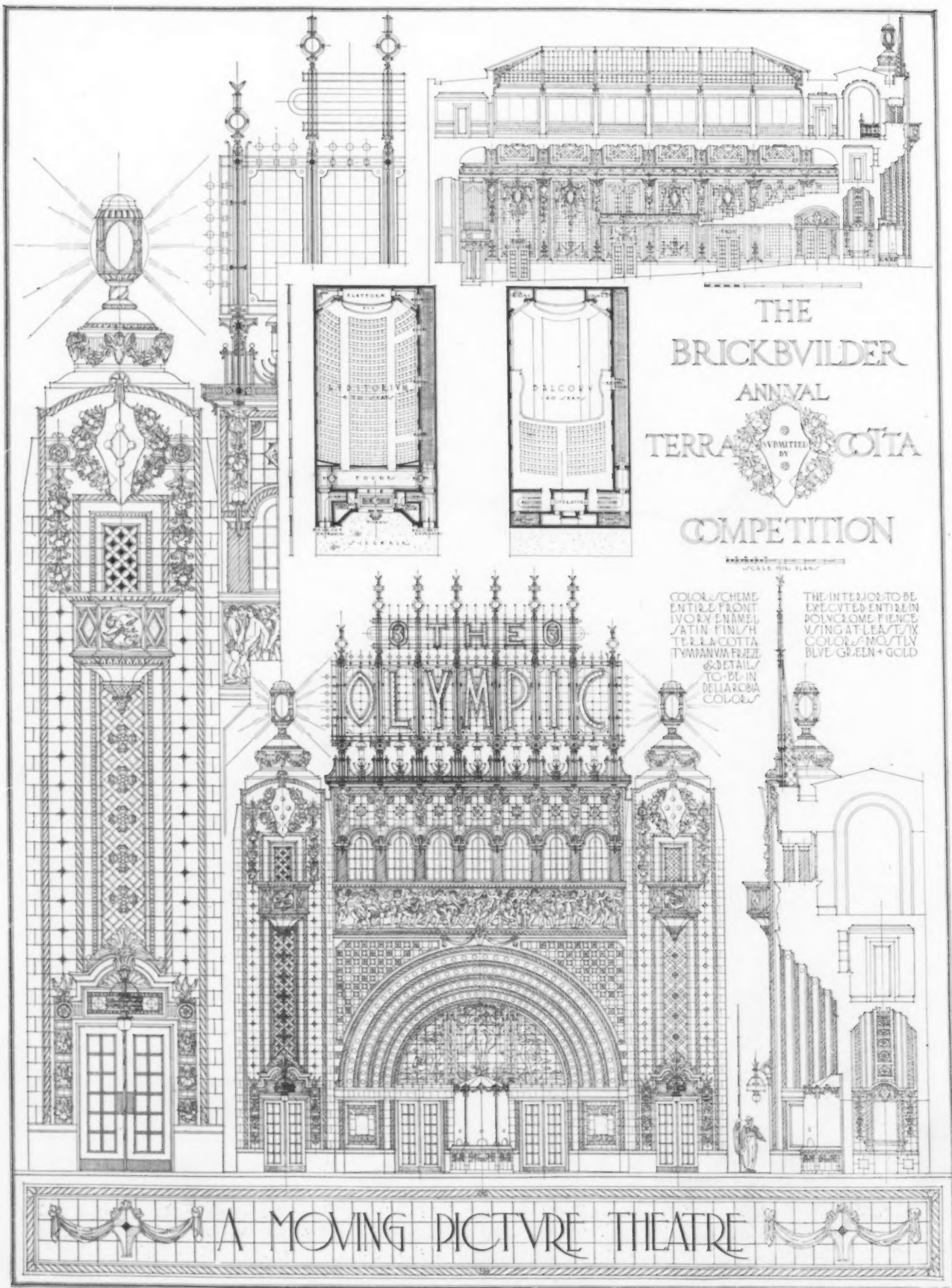
COMPETITION DRAWINGS.



THIRD PRIZE DESIGN

SUBMITTED BY GUSTAVE G. VIGOUROUX, NEW YORK, N. Y.

THE BRICKBUILDER.

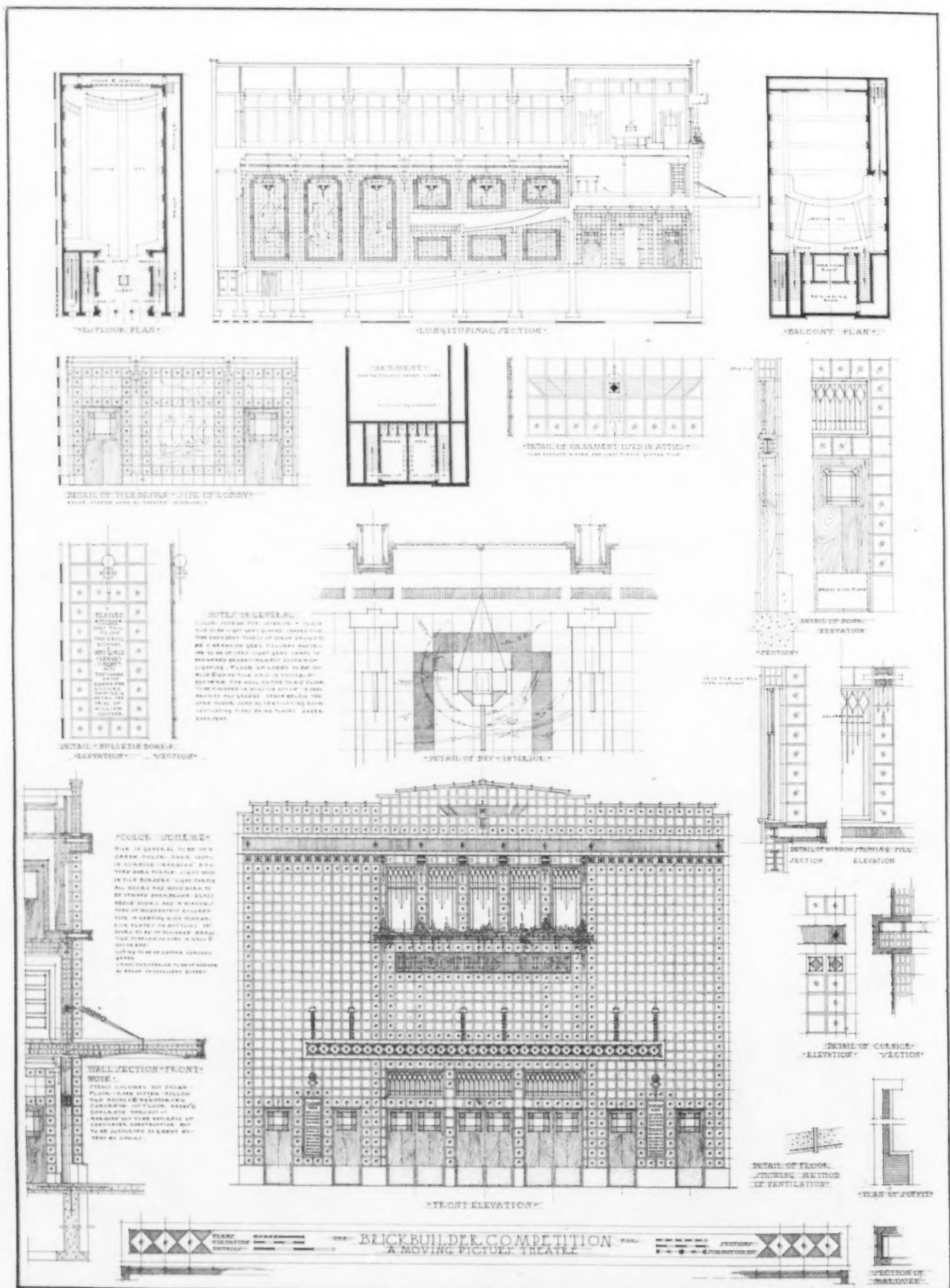


FOURTH PRIZE DESIGN
SUBMITTED BY JAMES FLAHERTY, BOSTON, MASS.

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SUBMITTED BY LeROY BARTON AND WALTER McQUADE, BROOKLYN, N. Y.

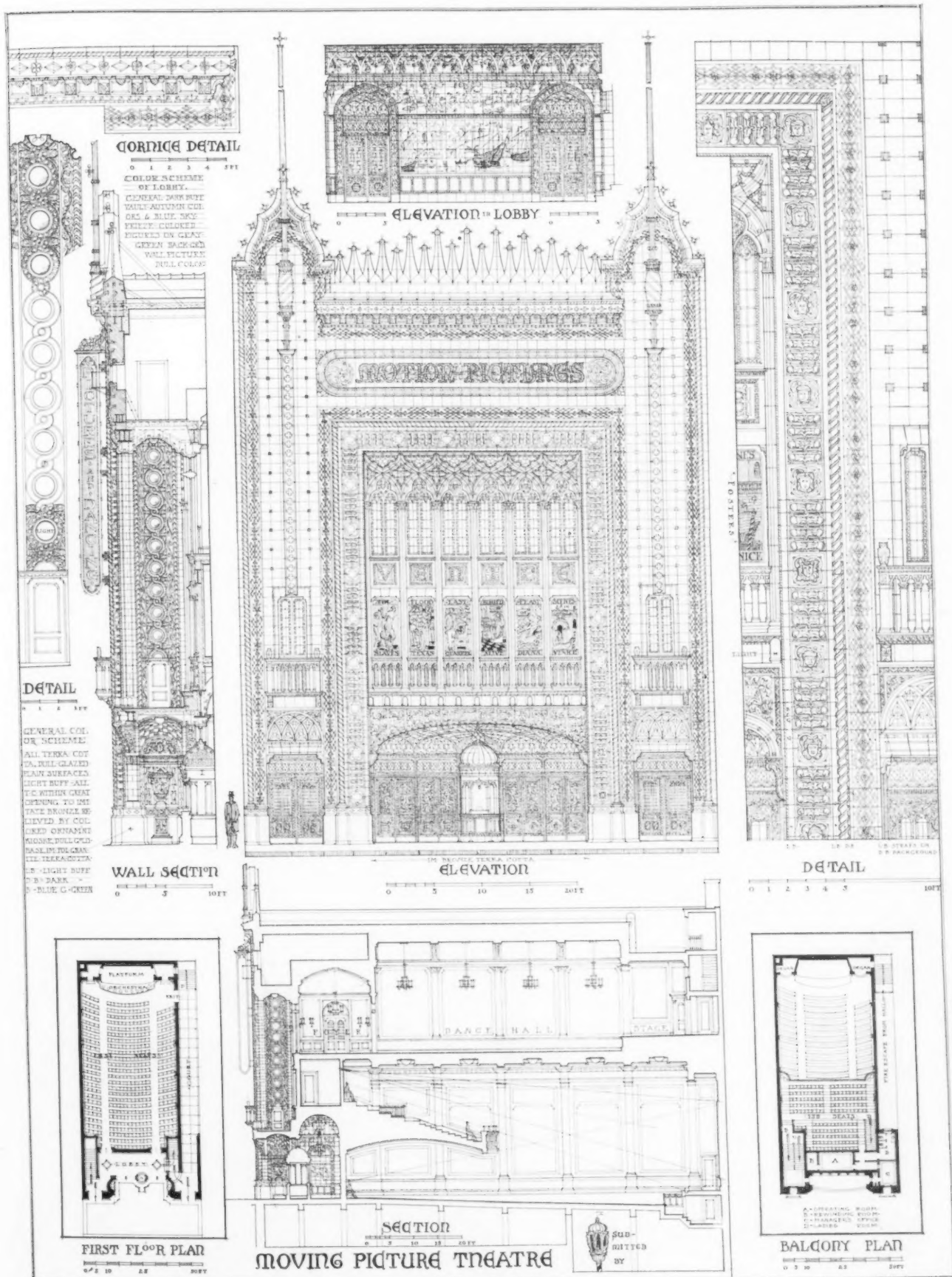
THE BRICKBUILDER.



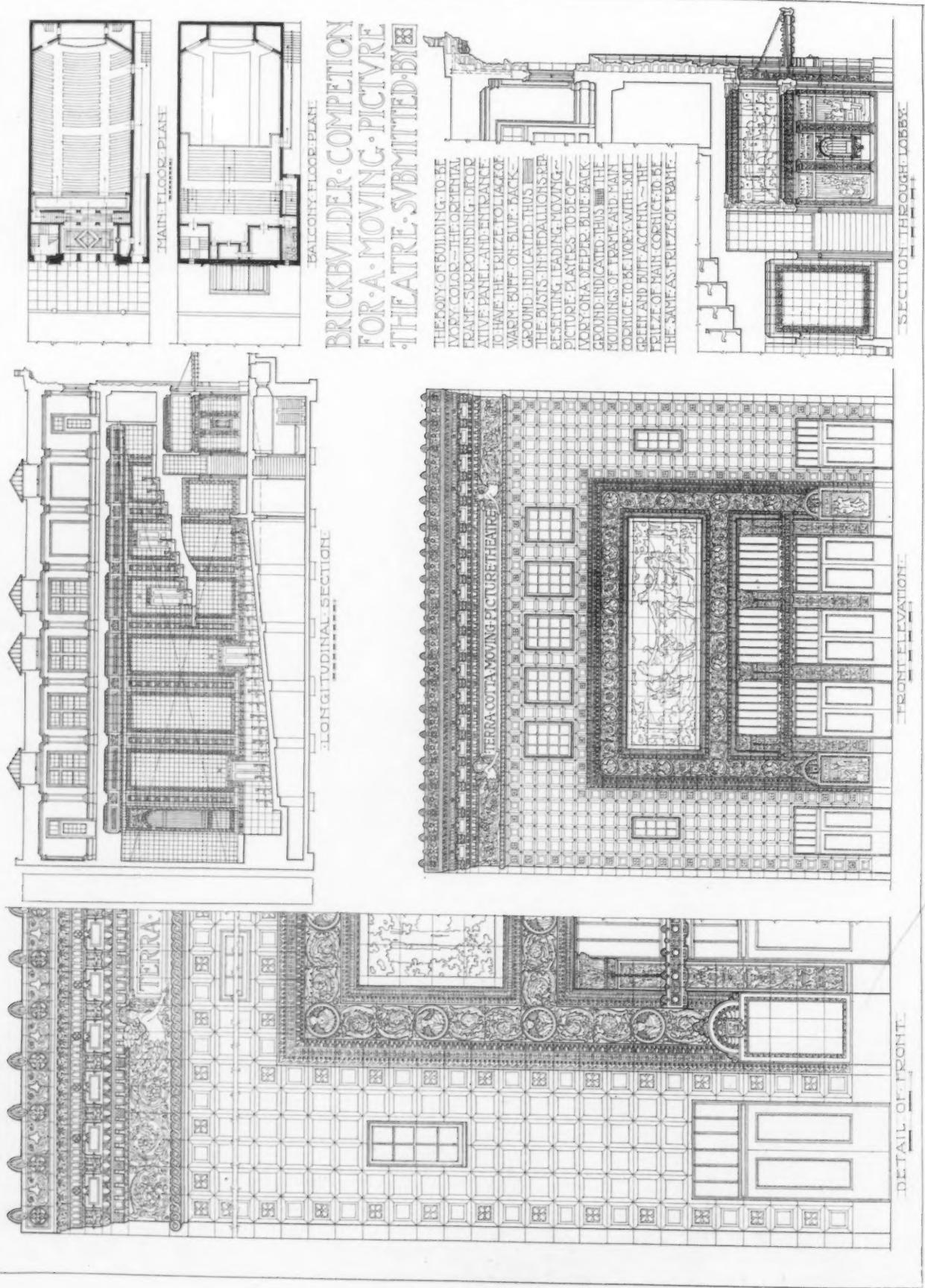
MENTION DESIGN

SUBMITTED BY ROBERT R. GRAHAM, SYRACUSE, N. Y.

COMPETITION DRAWINGS.



THE BRICKVILDER.

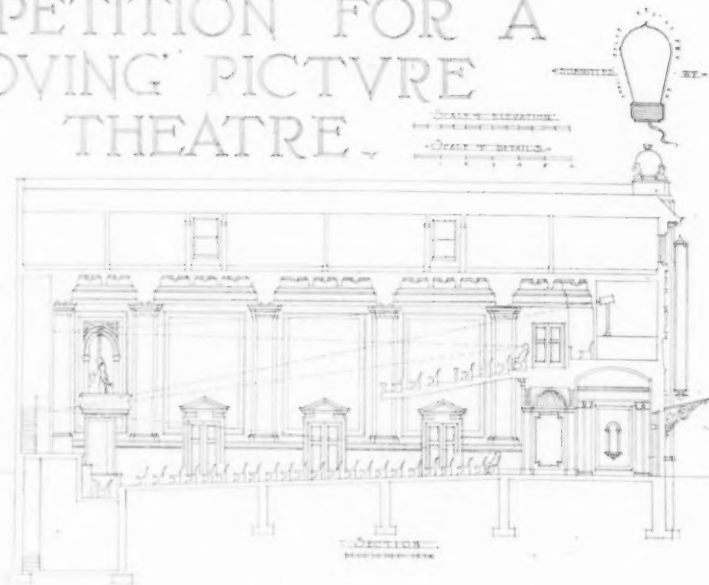
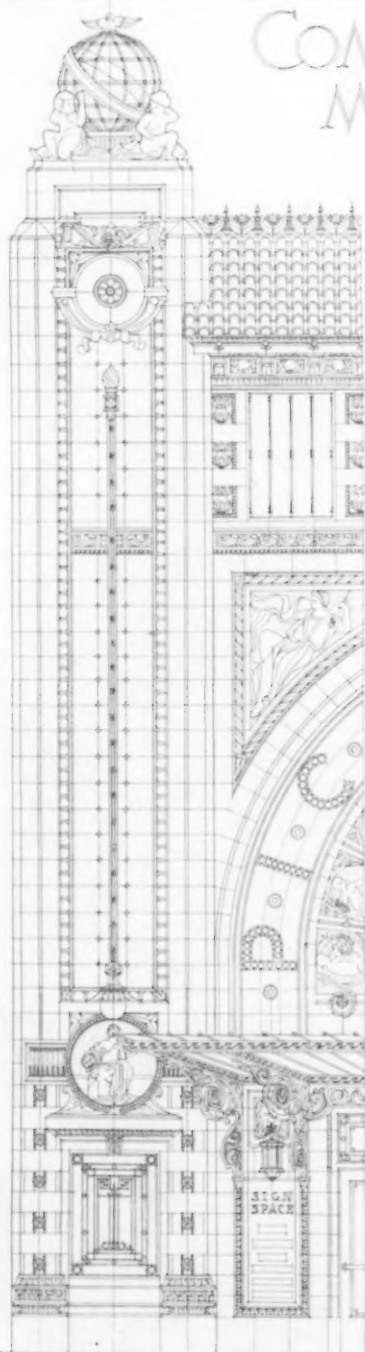


BRICKVILDER-COMPETION FOR A MOVING PICTURE THEATRE-SUBMITTED BY

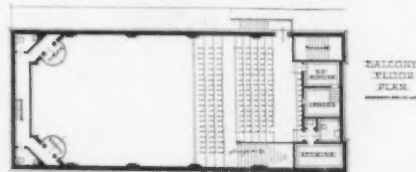
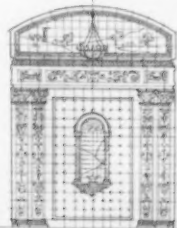
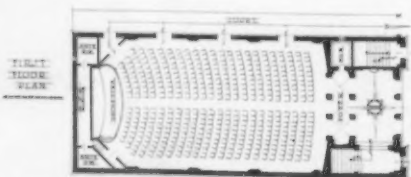
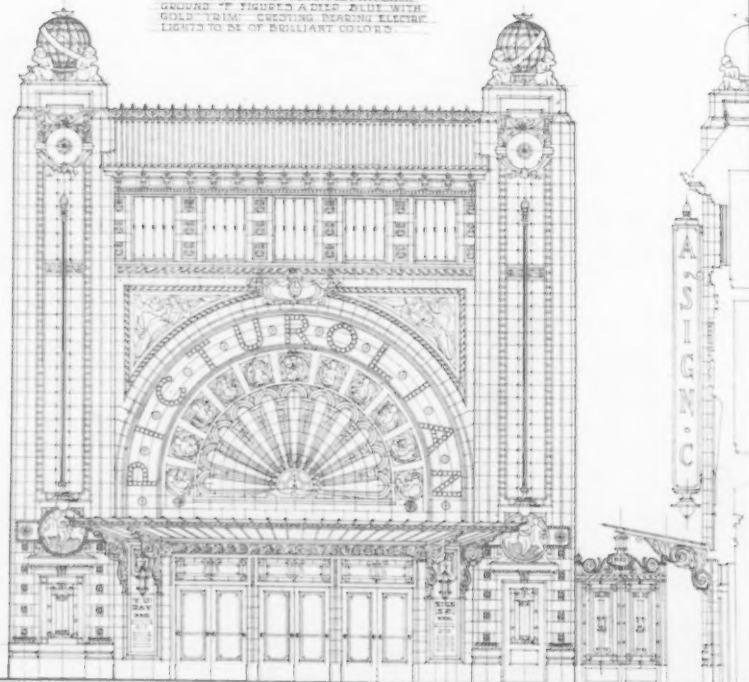
THE BODY OF BUILDING TO BE
IVORY COLOR—THE ORIENTAL
FRAME SURROUNDING DEOR
ATIVE PANEL AND ENTRANCE
TO HAVE THE FRIZZ OF LACTOF
WARM BUFF OR BLUE-EACK-
GROUND INDICATED THUS
THE BUSTS IN MEDALLIONS
RESTING LEADING MOVING
PICTURE PLAYS TO BE OF
IVORY ON A DEEPER BLUE-EACK
GROUND INDICATED THUS
SCULPTURES OF TRAIL AND MAIN
CORNICHE TO BE IVORY WITH XOT
GREEN AND BUFF ACCENTS—THE
FRIZZ OF MAIN CORNICHE TO BE
THE SAME AS FRIZZ OF FRAME.

MENTION DESIGN
SUBMITTED BY MIDGLEY WALTER HILL, NEW YORK, N. Y.

COMPETITION FOR A MOVING PICTURE THEATRE



COLOR SCHEME: MAIN BODY COLOR—
CREAM; MAT GLASS TERRA COTTA; FACE
GROUND OF FIGURES A DYE; BLUE WITH
GOLD TRIM—CHIEF OF THEATRE
LIGHTS TO BE OF BRILLIANT COLORS

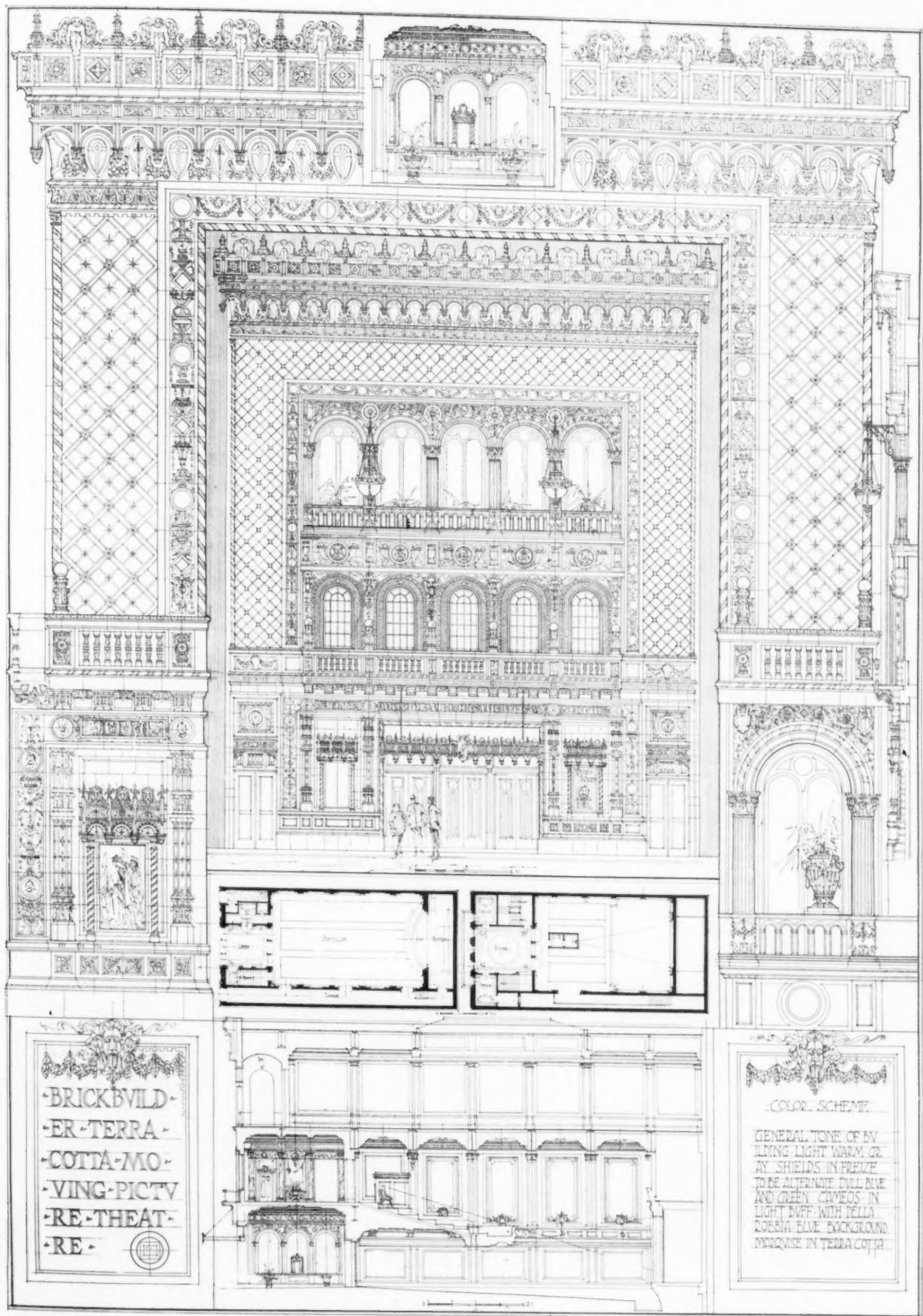


• ANNUAL TERRA COTTA COMPETITION •

MENTION DESIGN

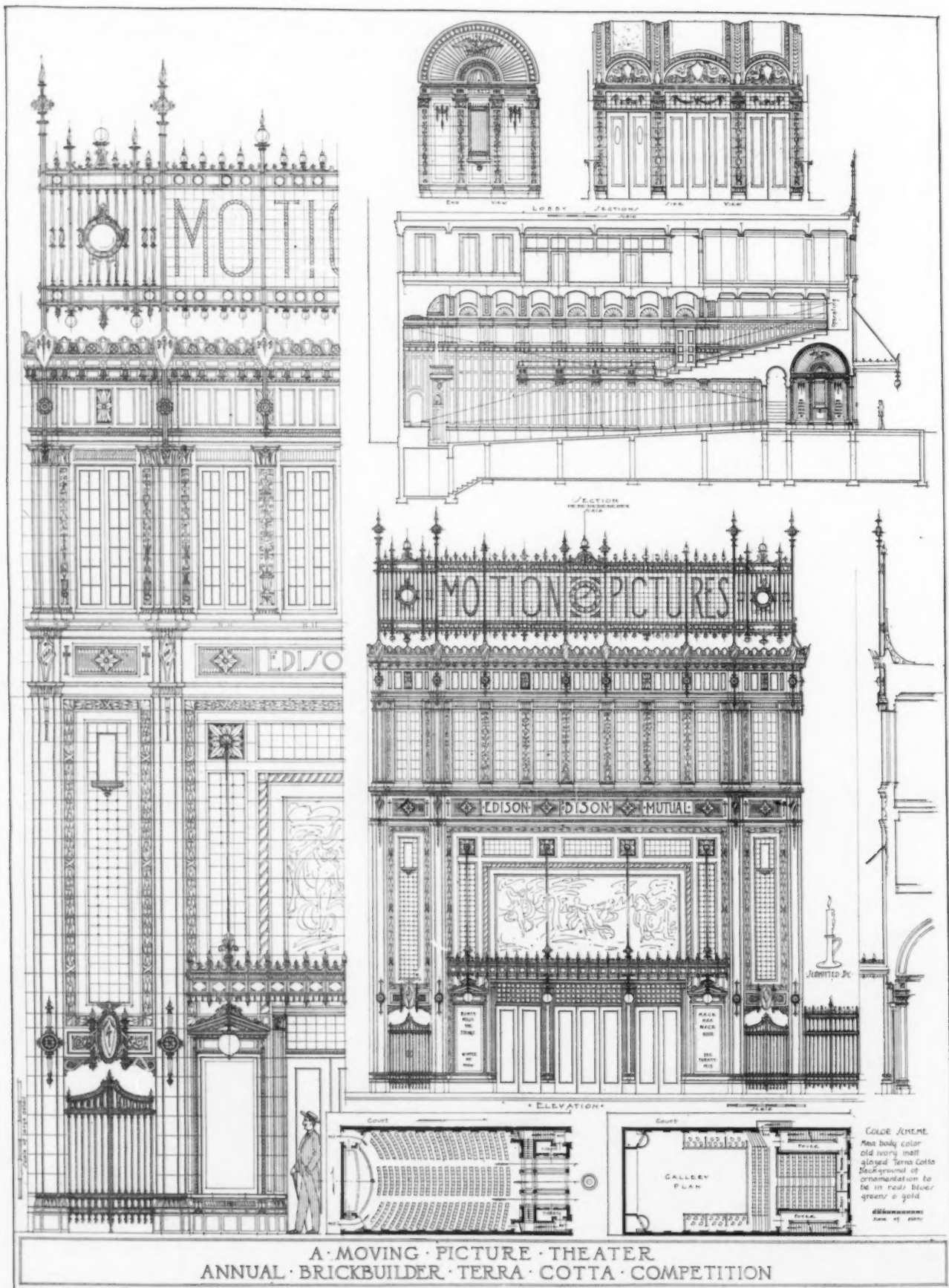
SUBMITTED BY WALTER SCHOLER AND DAVID W. CARLSON, NEW YORK, N. Y.

COMPETITION DRAWINGS.

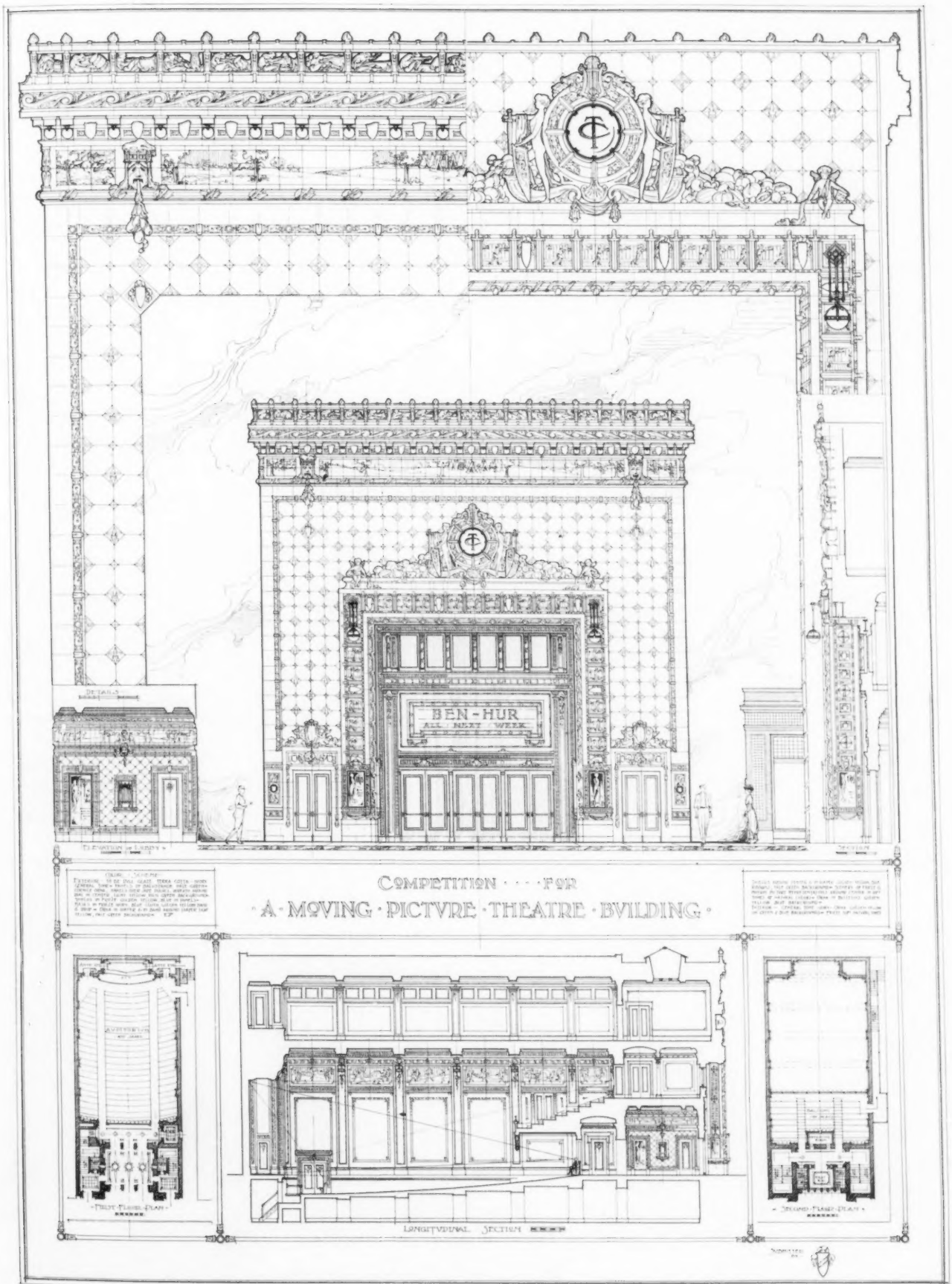


MOVING PICTURE THEATRE DESIGN
SUBMITTED BY EDWARD FLANDERS, SAN FRANCISCO, CAL.

THE BRICKBUILDER.

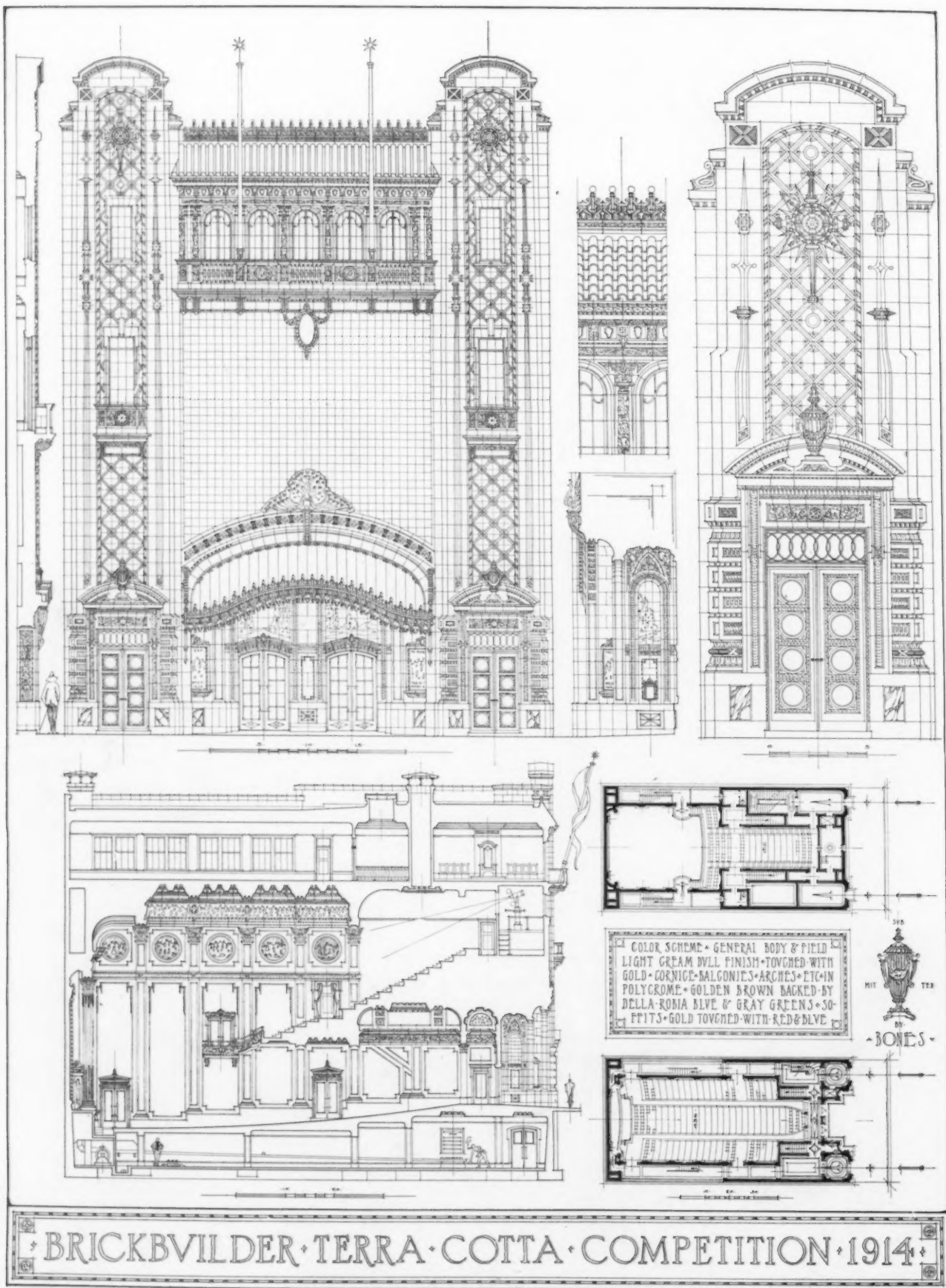


COMPETITION DRAWINGS.



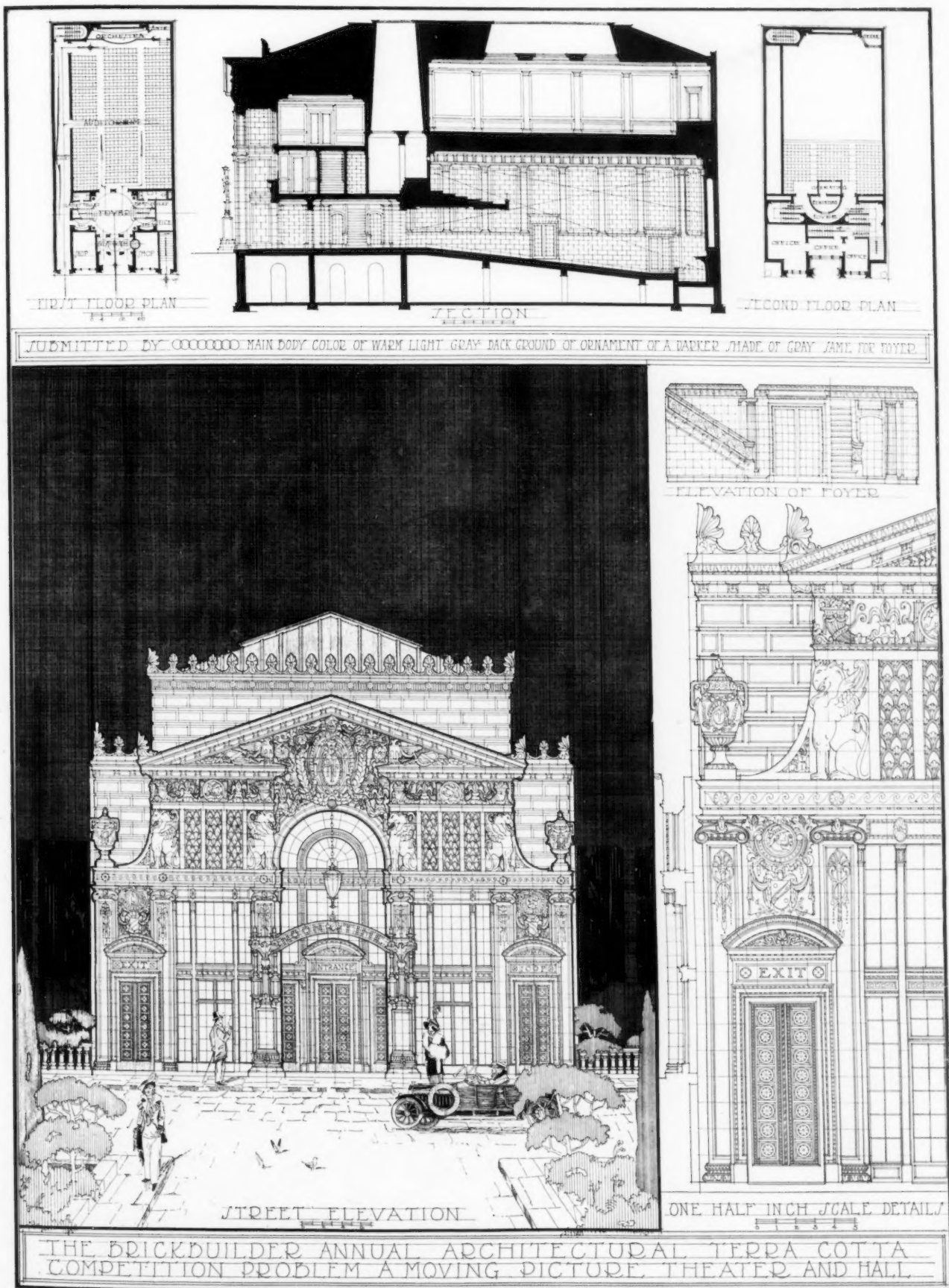
MOVING PICTURE THEATRE DESIGN
SUBMITTED BY F. P. NICHOLS, DAYTON, OHIO

THE BRICKBVILDER.



MOVING PICTURE THEATRE DESIGN
 SUBMITTED BY WALTER B. PHILLIPS, BERKELEY, CAL.

COMPETITION DRAWINGS.

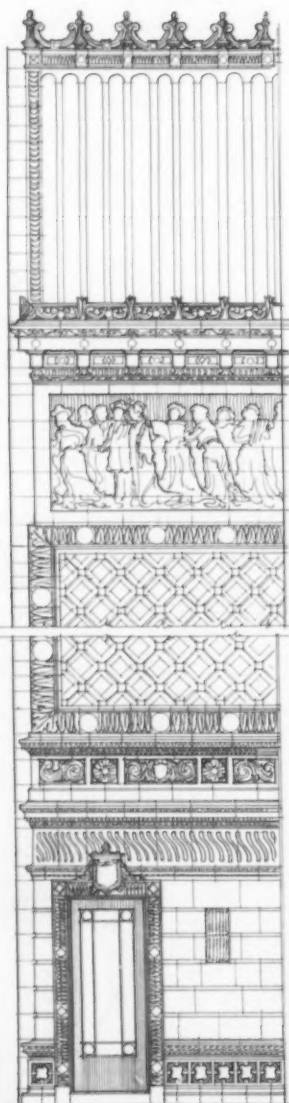


MOVING PICTURE THEATRE DESIGN
 SUBMITTED BY CLAUD W. BEELMAN, TOLEDO, OHIO

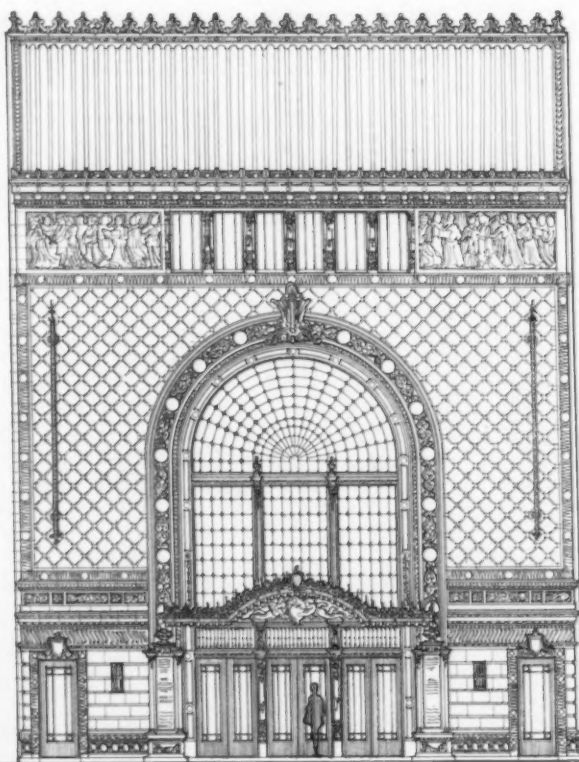
THE BRICKVILDER.

COLOR-SCHEME- THE-BODY-OF-THE-BUILDING-
TO-BE-LIGHT-GLAZED-BUFF-AND-CREAM
TERRA-COTTA-PALE-BLUE-LIGHT-GREEN
CREAM-AND-BUFF-COLORS-
LIGH-GREEN-TILE-ROOF-
THE-LOBBY-IS-TO-BE-HIGHLY-COLORED-

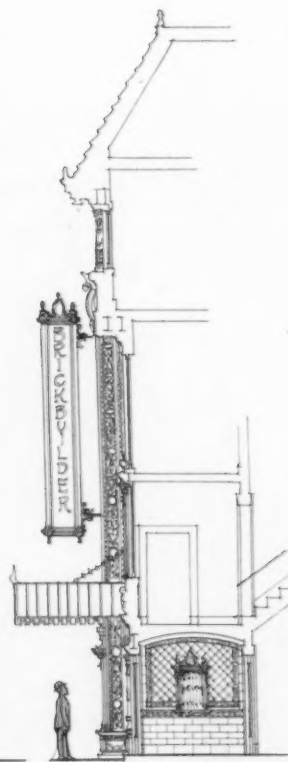
SUBMITTED BY



DETAIL



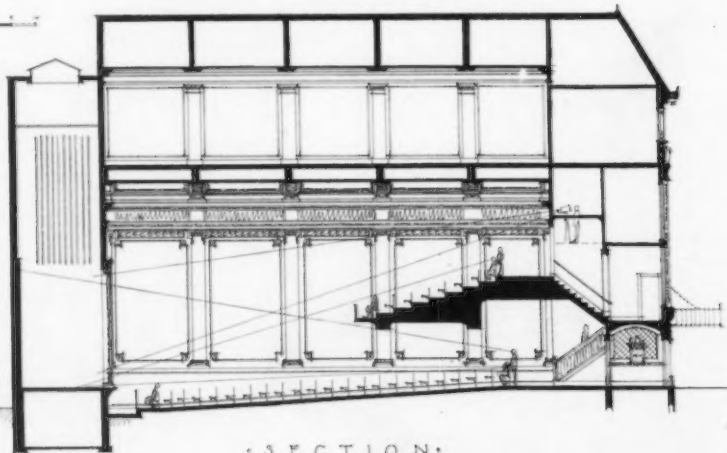
ELEVATION



SECTION



FIRST FLOOR PLAN



SECTION

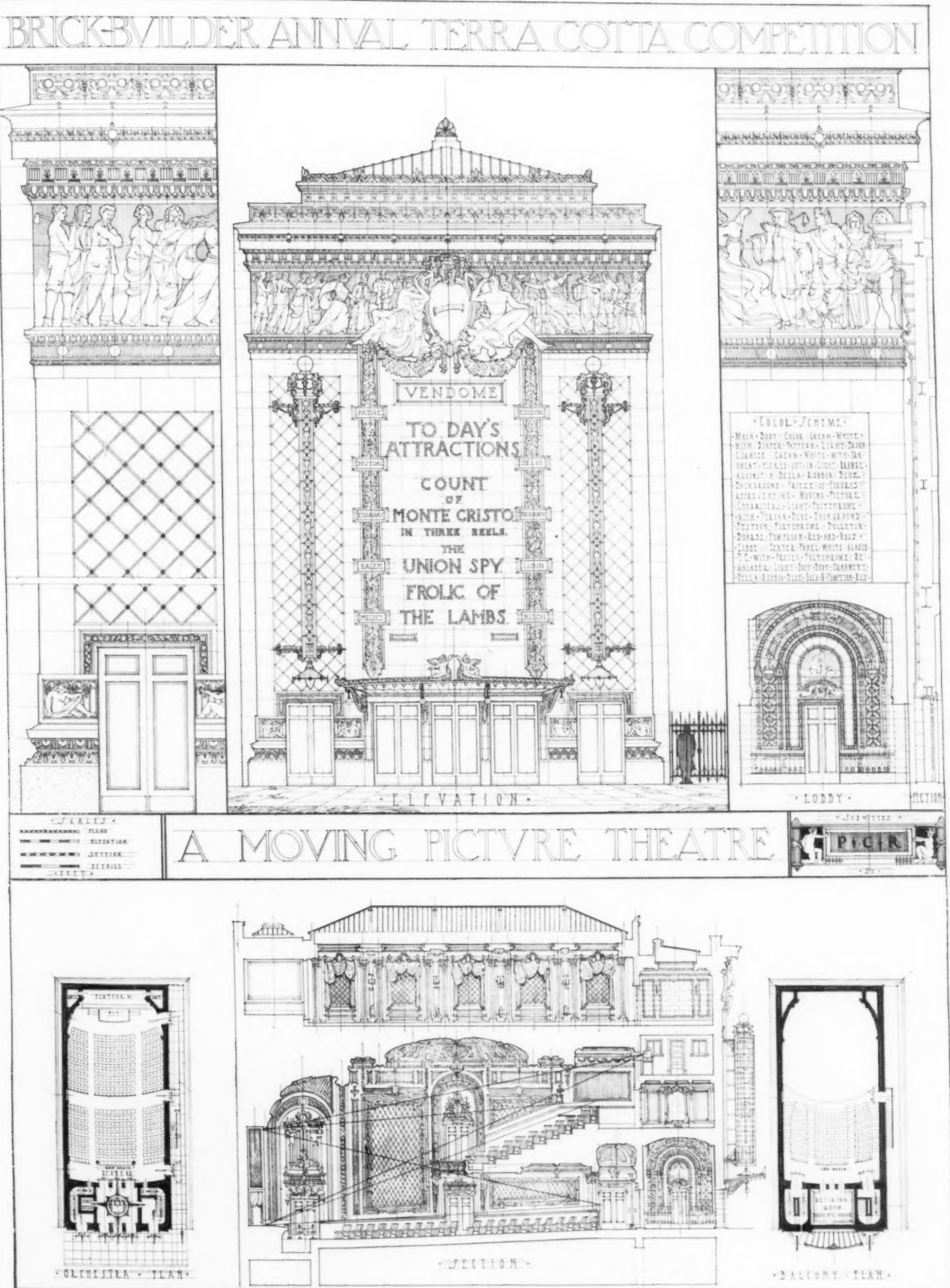


BALCONY PLAN

BRICKVILDER COMPETITION A MOVING PICTURE THEATER

MOVING PICTURE THEATRE DESIGN
SUBMITTED BY J. FRED COOK, NEWARK, N. J.

COMPETITION DRAWINGS.



BRICKVILLE COMPETITION MOVING PICTURE THEATRE

FRONT ELEVATION

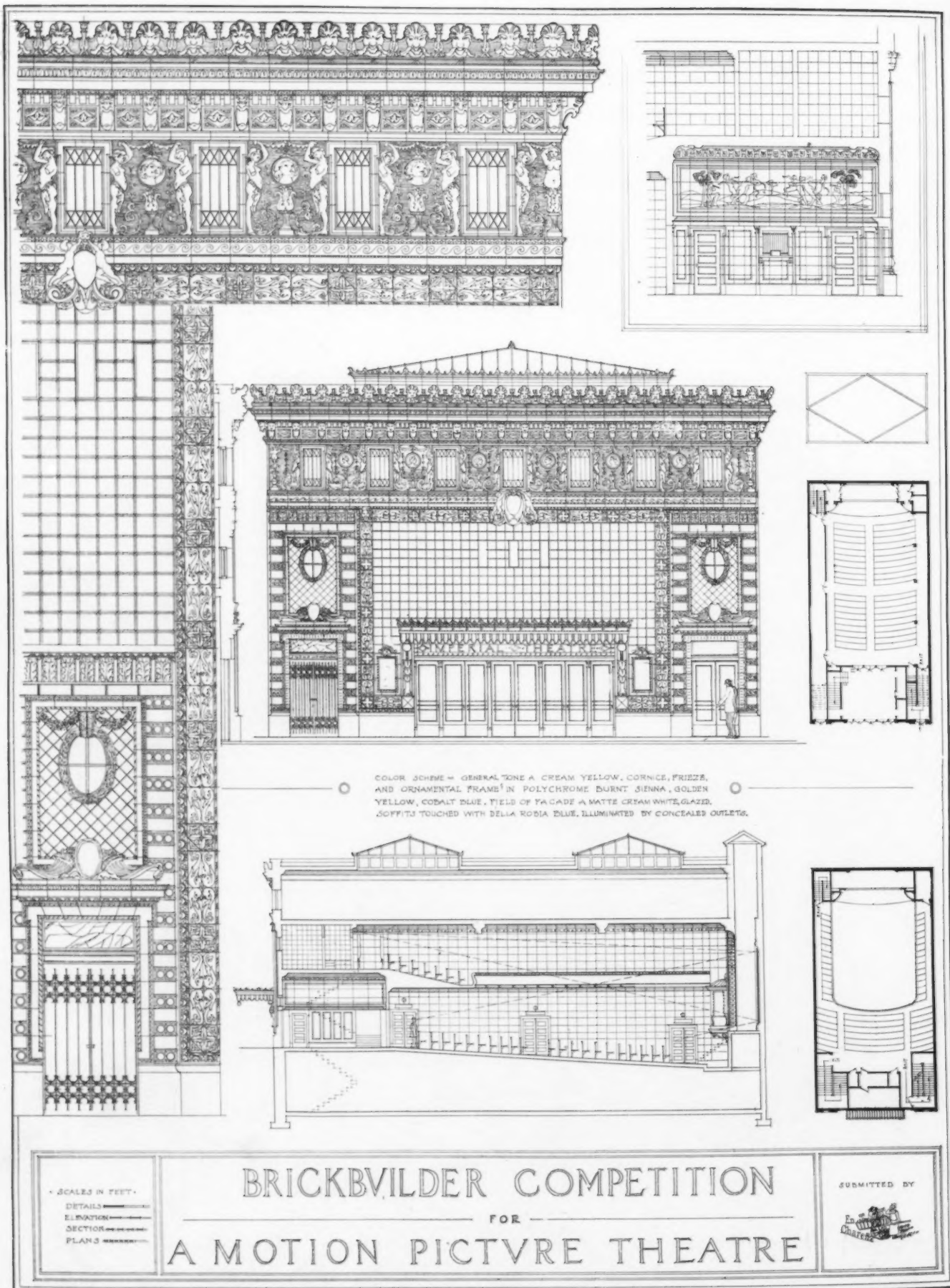
SECTION

Architectural drawing of the Brickville Competition Moving Picture Theatre, showing a front elevation and a section. The drawing includes a large central elevation with a tiled roof and a section showing the interior layout. Text labels include 'BRICKVILLE COMPETITION MOVING PICTURE THEATRE', 'FRONT ELEVATION', and 'SECTION'.

MOVING PICTURE THEATRE DESIGN
SUBMITTED BY ARMAND V. BERG, NEW YORK, N. Y.

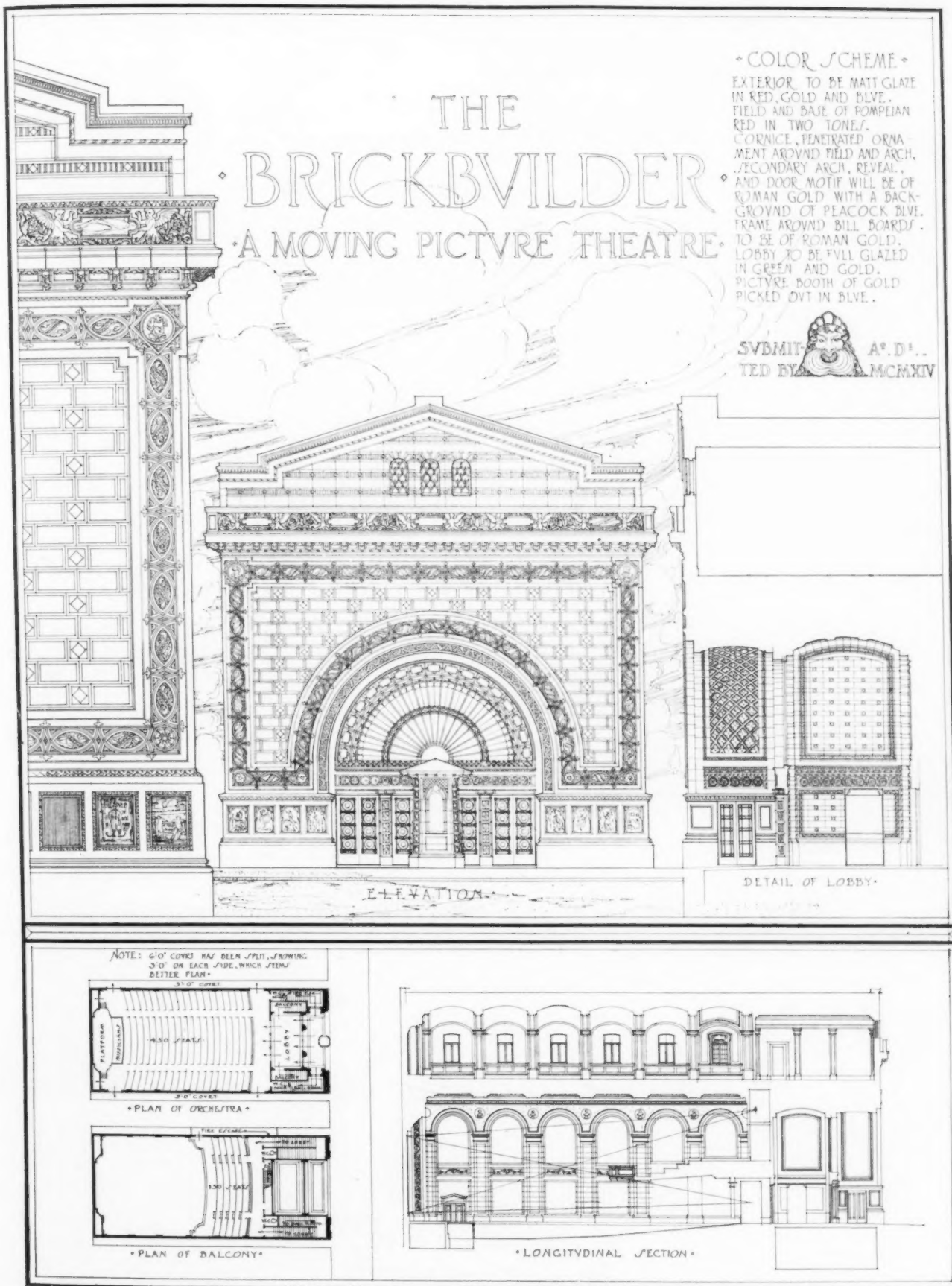
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MOVING PICTURE THEATRE DESIGN
SUBMITTED BY BENJAMIN H. WHINSTON, BRONX, NEW YORK, N. Y.



MOVING PICTURE THEATRE DESIGN
 SUBMITTED BY WILLIAM H. BAUM, NEW YORK, N. Y.

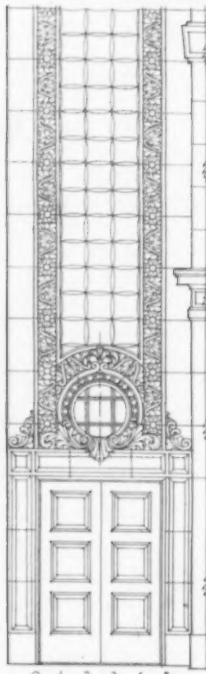
COMPETITION DRAWINGS.



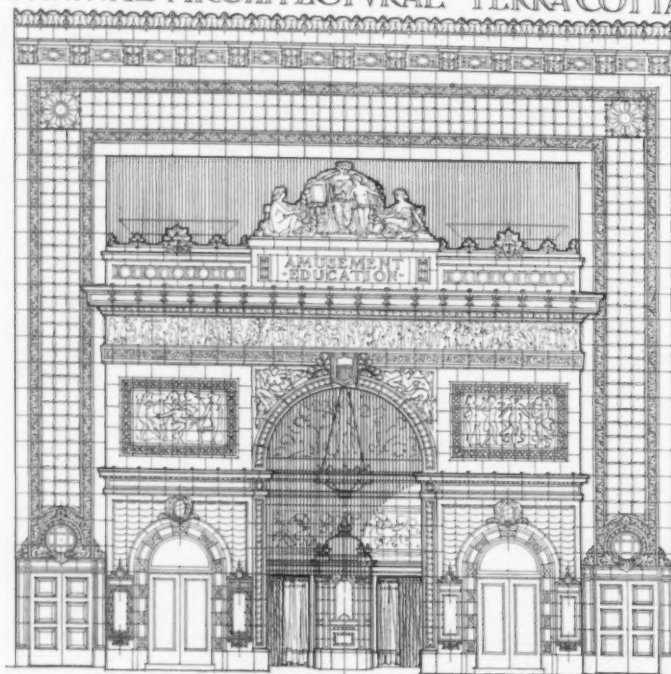
MOVING PICTURE THEATRE DESIGN
SUBMITTED BY GEORGE HOLLAND, NEW YORK, N. Y.

THE BRICKBUILDER.

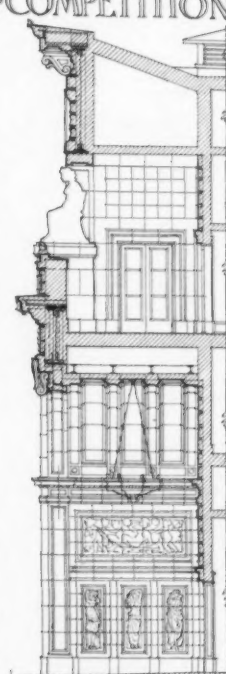
"BRICKBUILDER" ANNUAL ARCHITECTURAL TERRA COTTA COMPETITION



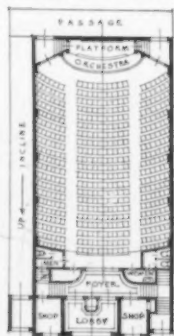
SCALE FOR DETAILS



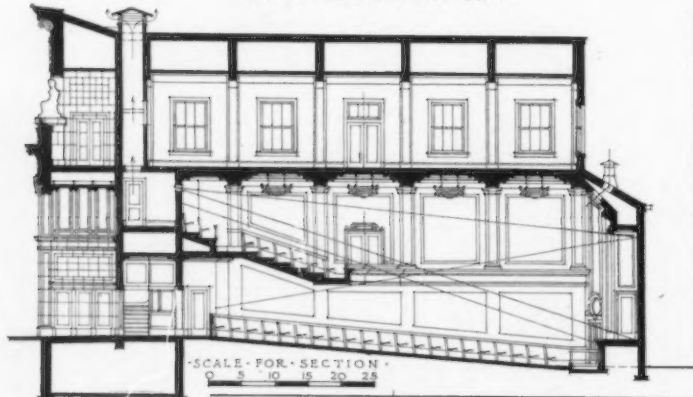
SCALE FOR ELEVATION



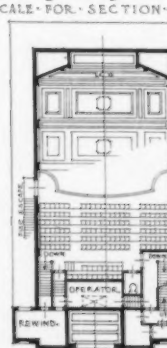
SCALE FOR SECTION



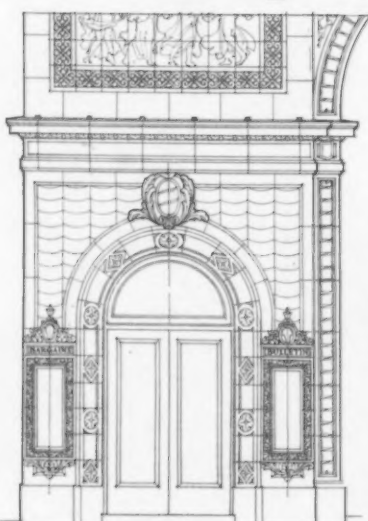
SCALE FOR PLANS



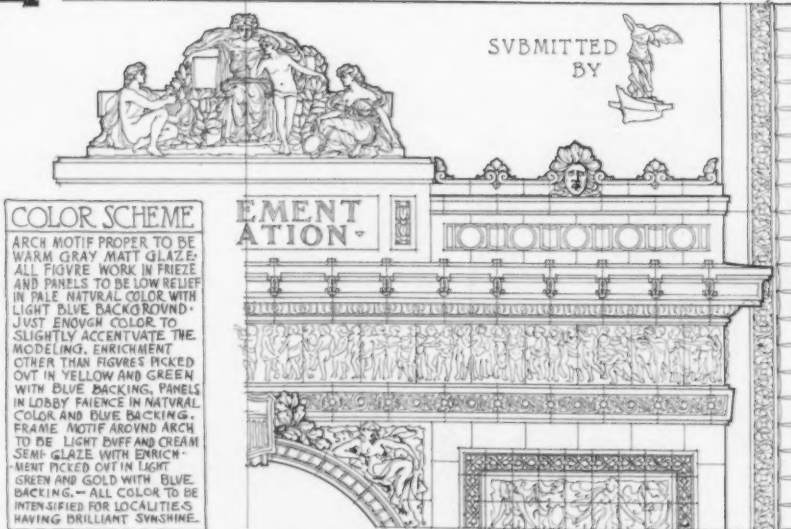
SCALE FOR SECTION



SCALE FOR PLANS



SCALE FOR DETAILS



SUBMITTED BY

COLOR SCHEME
ARCH MOTIF PROPER TO BE WARM GRAY MATT GLAZE. ALL FIGURE WORK IN FRIEZE AND PANELS TO BE LOW RELIEF IN PALE NATURAL COLOR WITH LIGHT BLUE BACKGROUND. JUST ENOUGH COLOR TO SLIGHTLY ACCENTUATE THE MODELING. ENRICHMENT OTHER THAN FIGURES PICKED OUT IN YELLOW AND GREEN WITH BLUE BACKING. PANELS IN LOBBY FAIENCE IN NATURAL COLOR AND BLUE BACKING. FRAME MOTIF AROUND ARCH TO BE LIGHT BUFF AND CREAM SEMI-GLAZE WITH ENRICHMENT PICKED OUT IN LIGHT GREEN AND GOLD WITH BLUE BACKING. ALL COLOR TO BE INTENSIFIED FOR LOCALITIES HAVING BRILLIANT SUNSHINE.

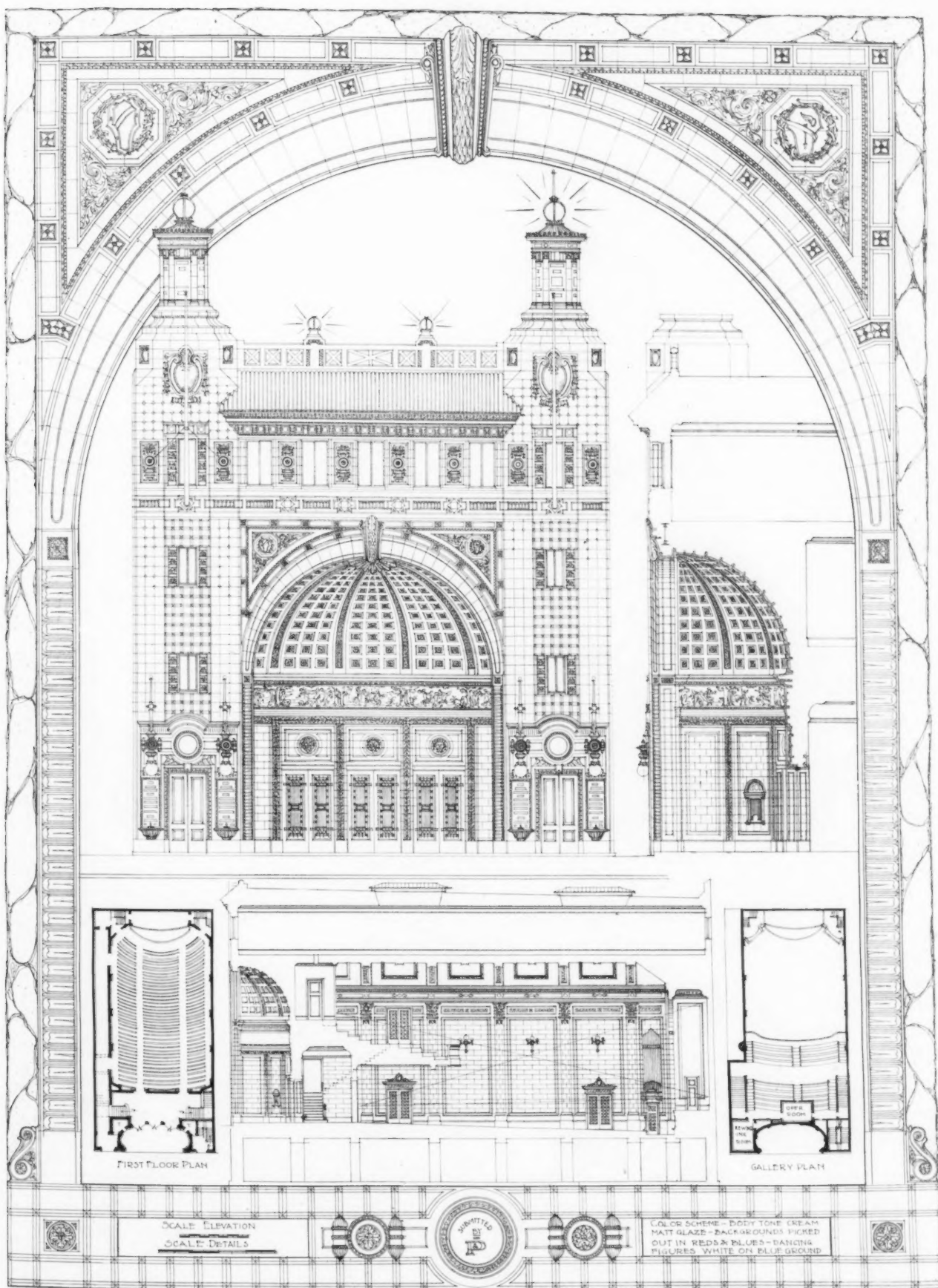
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A MOVING PICTURE THEATER

SCALE FOR DETAILS

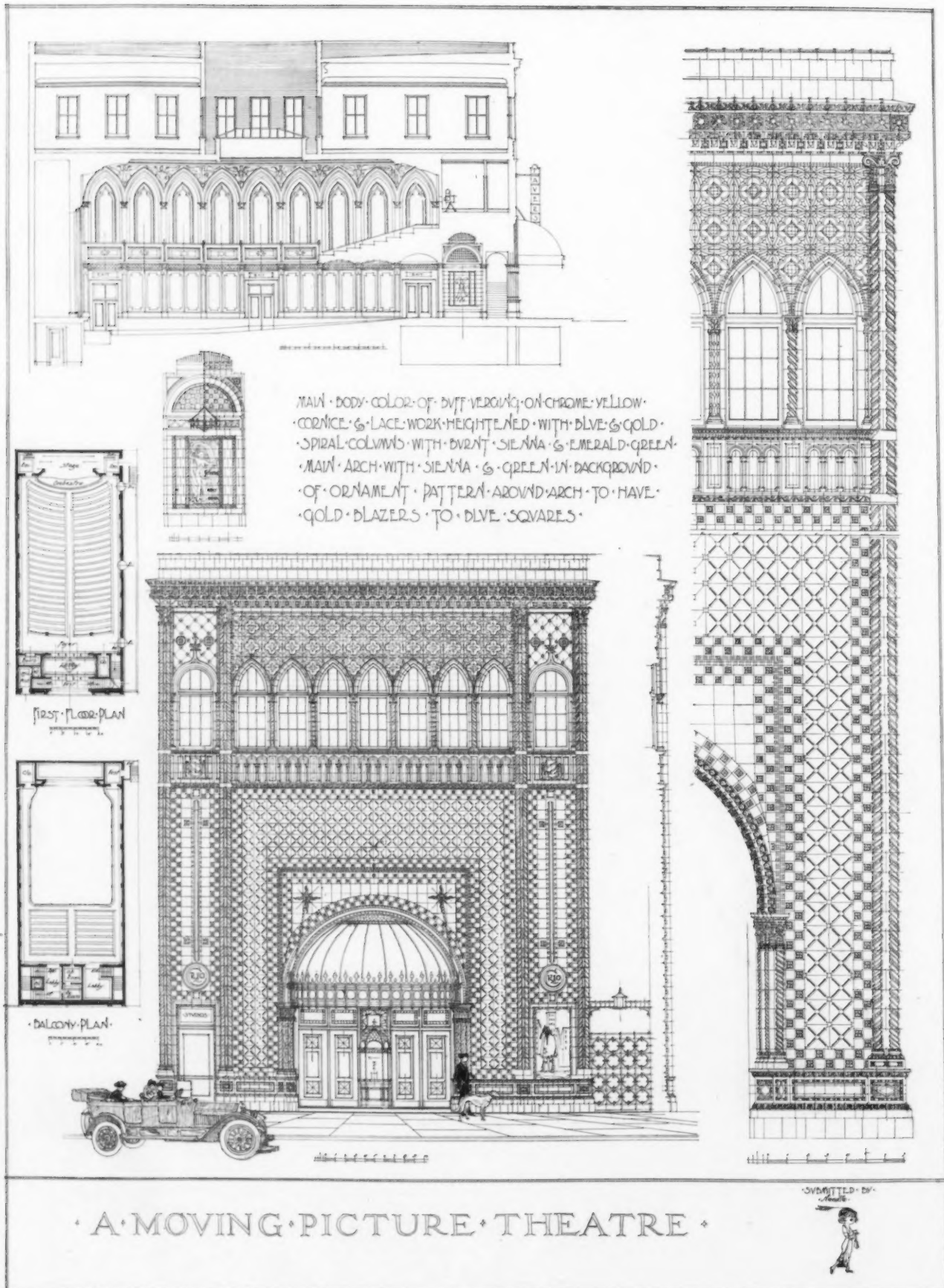
MOVING PICTURE THEATRE DESIGN
SUBMITTED BY DANIEL F. McLAUGHLIN, LOS ANGELES, CAL.

COMPETITION DRAWINGS.



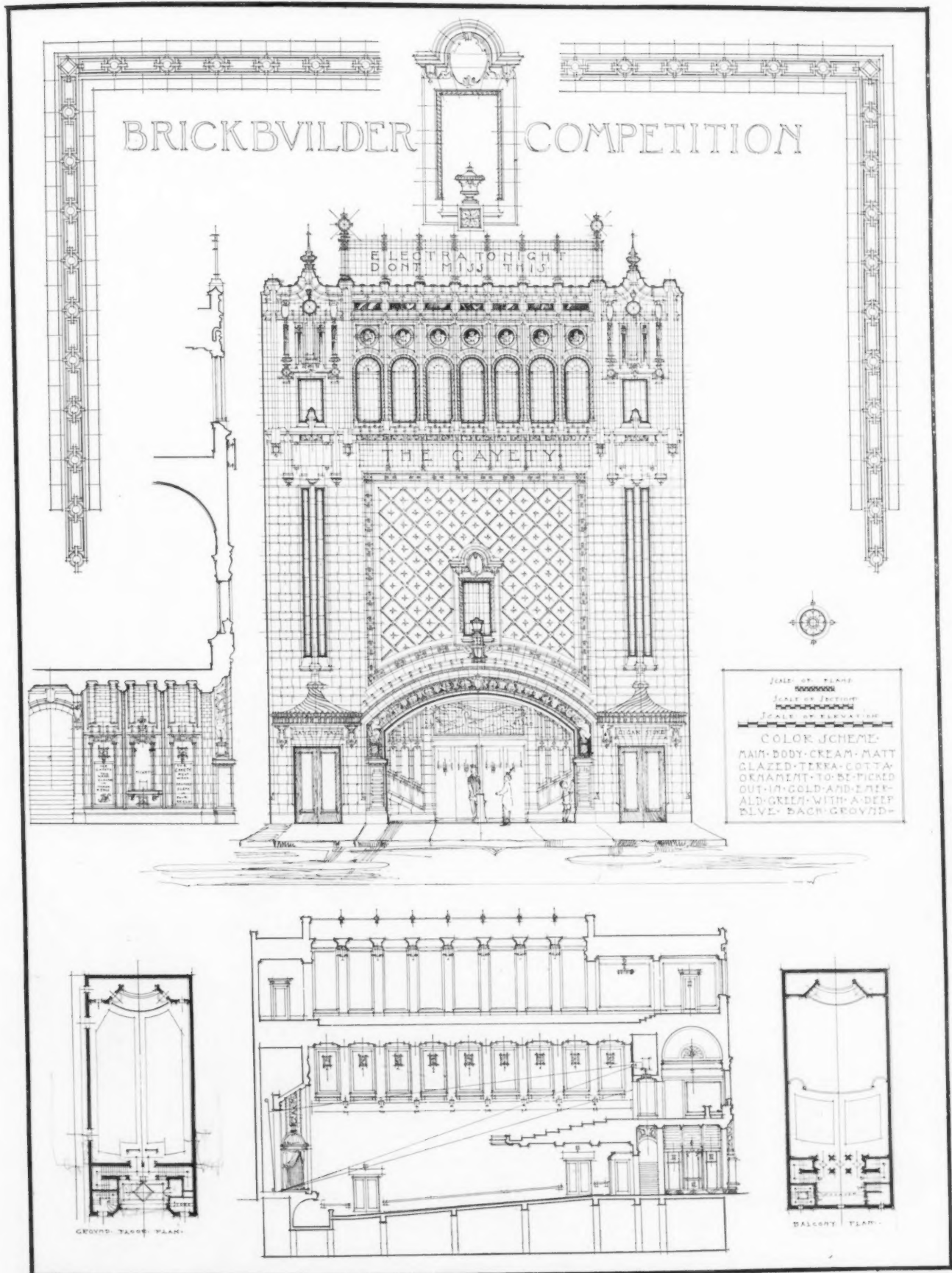
MOVING PICTURE THEATRE DESIGN
SUBMITTED BY E. NELSON EDWARDS, PHILADELPHIA, PA.

THE BRICKVILDER.



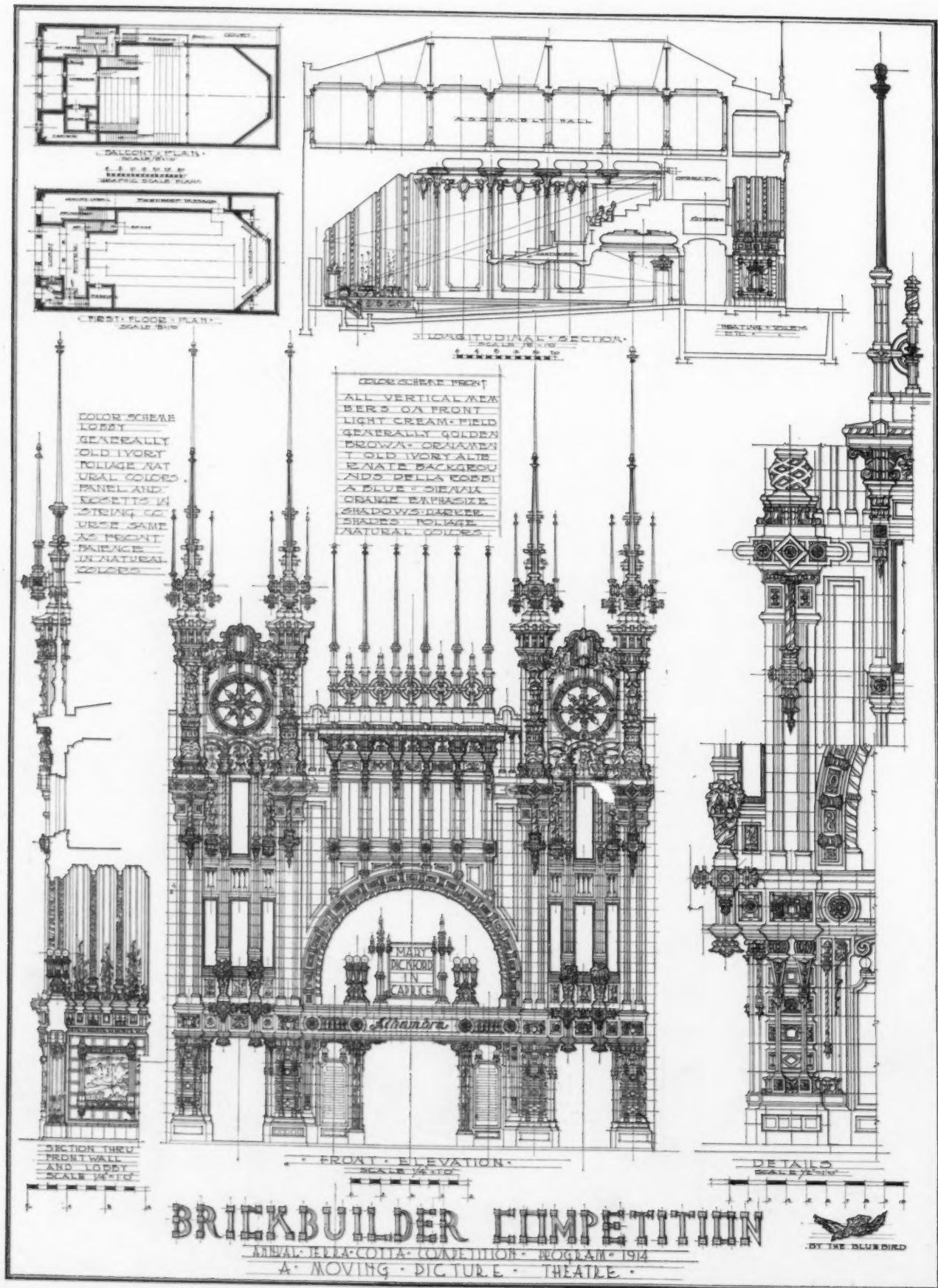
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COMPETITION DRAWINGS.



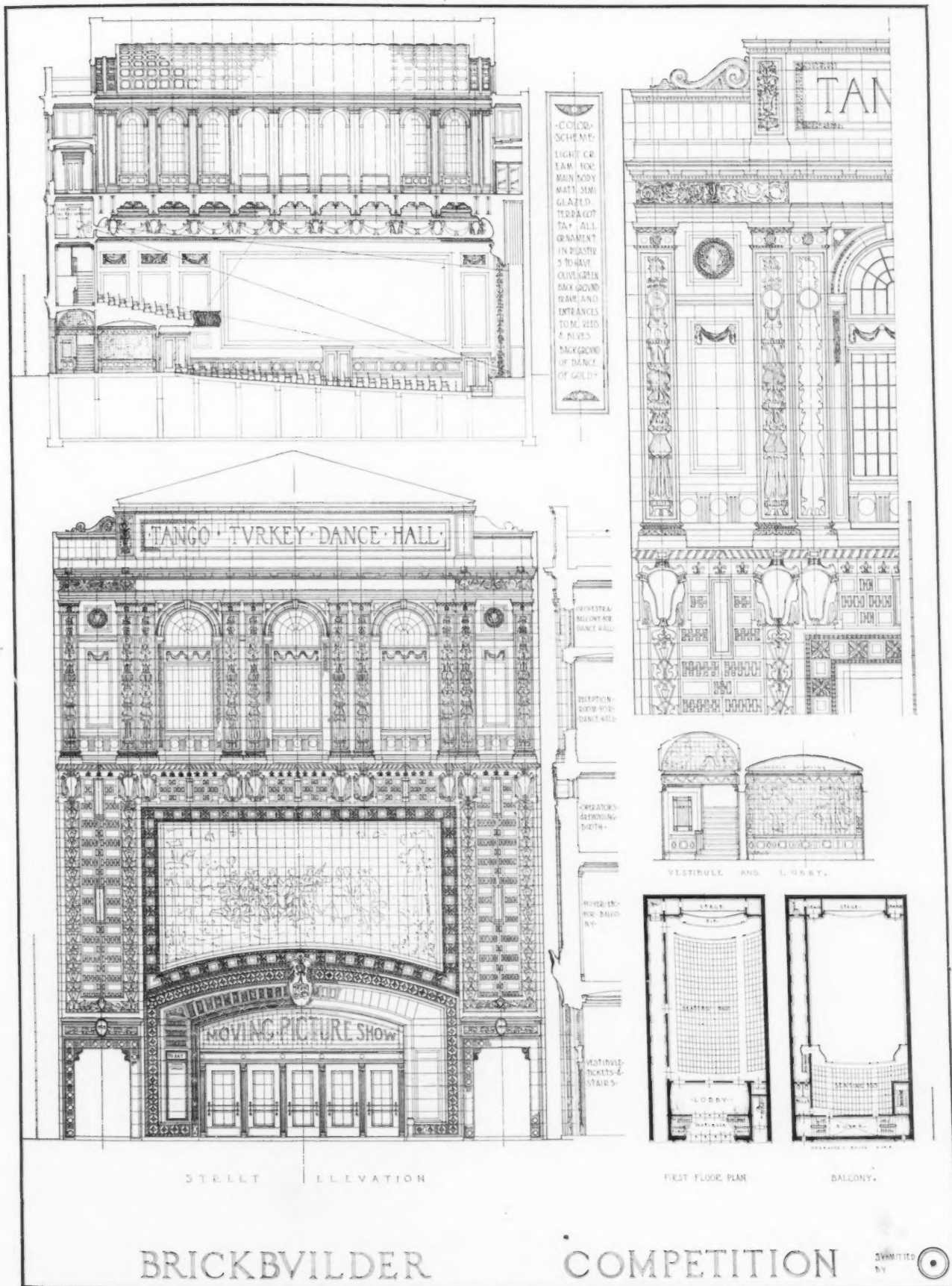
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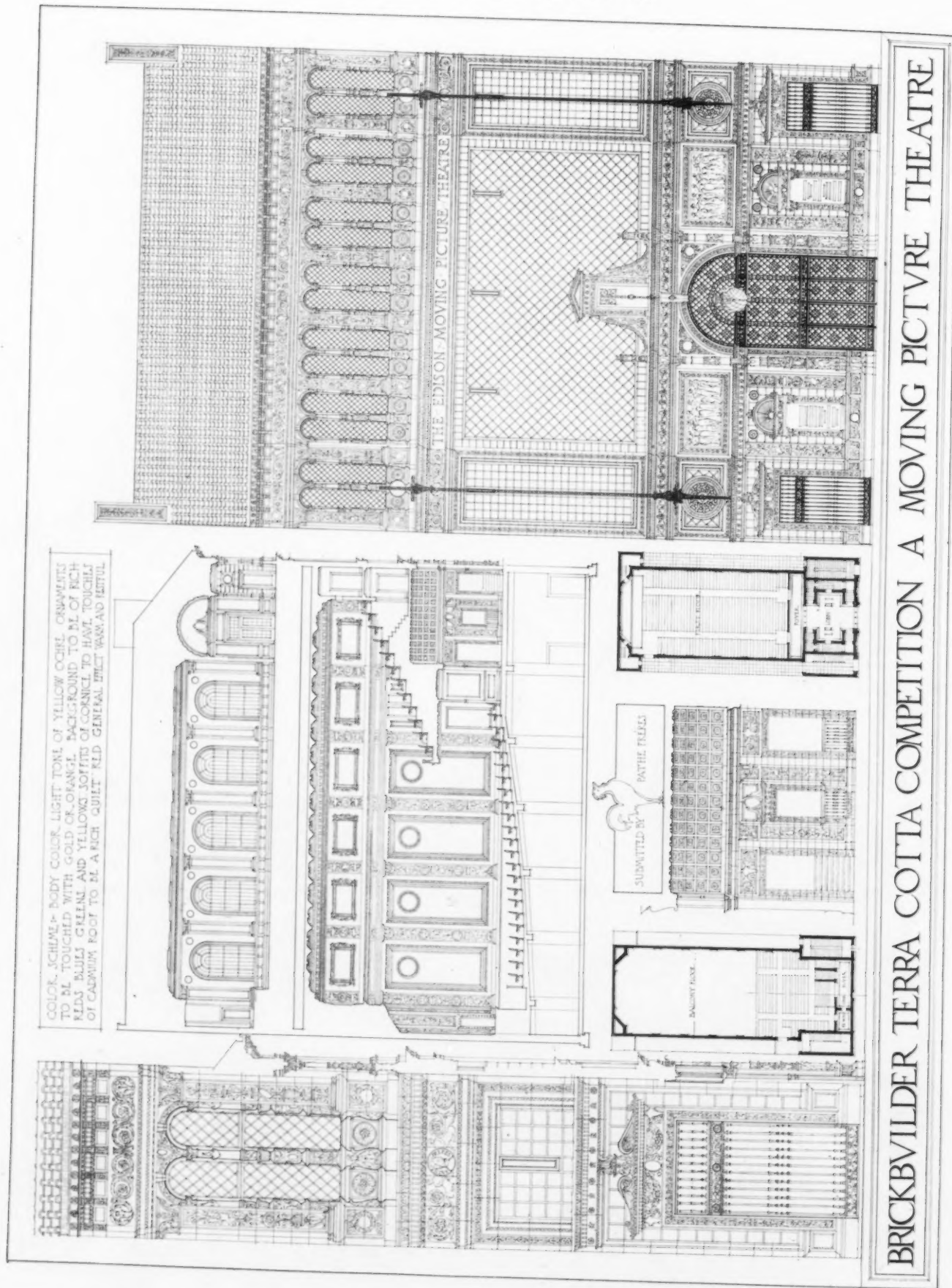


MOVING PICTURE THEATRE DESIGN
SUBMITTED BY M. LUTHER HAMPTON, COLUMBIA, S. C.

COMPETITION DRAWINGS.



MOVING PICTURE THEATRE DESIGN
SUBMITTED BY JOHN E. WALLACE, ST. LOUIS, MO.



MOVING PICTURE THEATRE DESIGN
SUBMITTED BY RALPH HERMAN HANNAFORD, ROXBURY, MASS.

↓ Architectural Treatment of the Moving Picture Theatre.

By AYMAR EMBURY II.

THE growth of the moving picture business has been extraordinary and unprecedented, the daily exhibitions are attended by millions of people, and the business bears to-day every indication of being permanently established on an enormous scale. There was no great surprise manifested when one found here and there in the city of New York occasional old stores filled with temporary chairs, perhaps borrowed from an undertaker, and used for a week or so as a moving picture theatre; people who themselves did not have the "movies" craze thought that these manifestations would soon be passed over, and that the movies would be a thing of the past. Now we find every corner crossroads that is able to support a grocery store and a saloon has added a moving picture theatre to its group of buildings, and there is under construction in New York to-day a theatre to be used exclusively for moving pictures, second in size only to the Hippodrome. Whether the present popularity of the movies is due to a transient interest due partly at least to its novelty, or whether it is a real addition to the life of the community and destined so to remain, we cannot say, but the movies are after all a method of play producing, and the theatre has existed for three thousand years. To me it seems likely that the moving picture will not soon be relegated to the scrap heap of ideas which were entertaining when new and had no intrinsic and permanent interest, although its present day popularity may be exaggerated just as was the bicycle craze; but bicycles still sell tremendously, although the craze is to-day dead because the bicycle has a real field of usefulness intermediate between other forms of locomotion, aside from the pleasure of learning to ride, and there seems no possible way of dispossessing it from this field, and the case of the moving pictures is not dissimilar.

In the big cities its present attraction may become lessened, for as its novelty decreases, and all possible developments have been made and changes have been rung, there will doubtless be many people who will prefer to save the dimes, now used nightly at moving picture shows, to buy occasional tickets to the theatre; but the vast class of the urban population, to whom ten cents a week constitutes a real dissipation, and the tremendous rural population too scattered to support a theatre, will always seek theatrical entertainment, and it seems that motion pictures alone are adapted to fill this field.

Besides being a substitute (and a very acceptable one) for the play, the moving picture has many other uses. It is the cheapest way to travel, and makes London, Moscow and Melbourne as familiar to us as Boston is to a New Yorker. On the screen millions of people can see the coronation of a king, which can actually only be viewed by the titled few. We can fight vicariously with Pancho Villa in Mexico, and without fear of bullets, but with a real sense of battle; and since in each of us there persists something of the child, we delight in viewing our fairy tales come true: the frog turned into a prince by the wicked fairy; men leaping marvelous distances, and people dismembered by automobiles, shaking themselves together and coming back to life. Kings and mountebanks, queens and dancers, pass across the film to entertain us; battles are fought and wars ended before our eyes; our fleet circles the globe without passing from our sight, and our dreams of romance are made visual only by walking around the corner and paying ten cents.

The mechanics of the reproduction of pictures have in every way been improved: first in the rapidity with which pictures can be taken, and in their evenness of development; then we had the colored movies of which the earliest were simply stained pictures, and since the staining was done by hand, they were expensive, untrue to nature, and not uniform. Then by an ingenious use of the three color process the kinemacolor pictures were evolved; within the last six months we have had the moving pictures and the phonograph synchronized so that the movies talk, and patents have just been issued by which the already almost imperceptible space of time between the successive pictures will be eliminated, and each gap will be filled by a picture of its own, which will do away with the "flicker" and consequent eye strain, and since this can be applied quite as well to color work, the movies mechanically have now been practically perfected—the only limitations remaining being the irreparable ones due to the fact that photographs must be taken with a lens and true perspective is therefore impossible. Could there be added to the moving pictures the solidity of the stereopticon, there would be nothing left to be desired.

The cost of housing this business has been a very considerable item in building construction for the

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last two or three years. The people entering the business have apparently finally made up their minds that the business is here to stay, and that an investment in permanent buildings, designed especially for moving picture purposes, is worth while.

As was said above, the business has grown to such vast proportions that a theatre in New York has been erected especially for moving pictures, with the second largest seating capacity in the city, and there is no public avenue in a town of any size at all in the United States which does not contain one or more buildings especially constructed for the showing of moving pictures and designed to some extent at least with an intelligent eye toward the requirements of the business. To recapitulate them briefly, they are safety first; ample exits and a fireproof booth for the film and machine; good bill-board space, and a design so expressive of the purposes of the building that signs are unnecessary. It is the last of these requirements which is most truly an architectural function, and which most interests me, because there has been no floundering around in search of an appropriate type, but almost all the designers seem to have reached independently about the same conclusion, which may be, and most usually is, extremely bad architecture, but can be, and occasionally is, very handsome indeed. The style is, of course, of a sort of Art Nouveau, and there does seem to be pretty good logic back of the sentiment which expresses an invention recently unheard of in forms equally new.

Art Nouveau has by no means reached its final form; it is still more or less embryal and confused, although it really does seem to have something in it which is vital and of influence, even on our Classic architecture, although it will probably not be completely amalgamated with that historic style. I rather expect to find it flourishing as an independent style, much as the Classic and Gothic styles of to-day are being used, although in a subordinated position.

The material most commonly used in these moving picture theatres is also something, in a sense, new, and like the style is singularly well adapted to expressing the moving picture house. Terra cotta is, of course, the material in mind, and while it is perfectly true that the Greeks used terra cotta for small ornamental portions of their masonry structures, terra cotta as a means for facing whole buildings is (with a few exceptions) a modern development. Terra cotta is besides a very useful building material of sound structural value, and should be employed without disguise.

Unfortunately, terra cotta has been pushed too much as a substitute for stone where it should be promoted as a material worth using on its own merits, and curiously enough it is in these Art Nouveau moving picture theatres that the material has been treated with the greatest frankness. This probably arises from two reasons, the first being that the decoration in Art Nouveau is essentially plastic, and the second being that a very free use of color has been desired by the proprietors of these theatres to make them attractive to the public, and one can hardly imagine stone forms duplicated in colored ornament. A third possible reason is that both the material and the style are excellently adapted to the treatment of large, plain surfaces, and the fact that moving picture houses are dark inevitably results in façades without window openings and with large surfaces to be decorated. Buildings, then, for the movies are tremendously well adapted, both sentimentally and practically, to the use of terra cotta, and I think it is more or less creditable to the American architectural profession that they should have realized this far in advance of their European contemporaries. I have seen in England and France many amusing designs for the movies, but terra cotta was not used in any of them, and in consequence most of them looked like a cross between a small bank and a sublimated store. It is interesting, too, to find that this new type of building has been so well handled in principle at least, whatever we may think of the particular examples, since the other new type of building with which American architects have had to deal, the sky scraper, has not yet arrived at any definite conclusion. The old controversy as to treatment is still acute, and while we have at the present time better examples of sky scrapers with both Classic and Gothic motives than the original ones, I do not believe that the architects have any better ideas as to which they should use than they did in the old days.

The divergent directions taken by art movements can never be fully explained, and why the moving picture theatres should so instantly have found a satisfactory solution, while a problem of no greater apparent difficulty, the sky scraper, should present us with such inadequate solutions, is no more easy to comprehend than the development of Gothic and Classic architecture. With the facts before us, it is, of course, easy enough to assign reasons why the Art Nouveau style in terra cotta should express a moving picture theatre; but if we were still waiting for the cat to jump, I think there are few of us who would venture a

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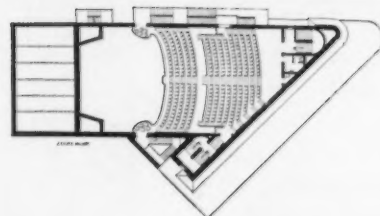
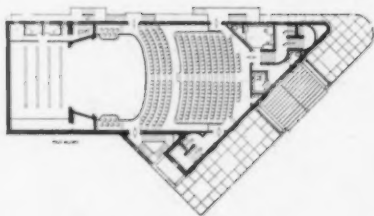
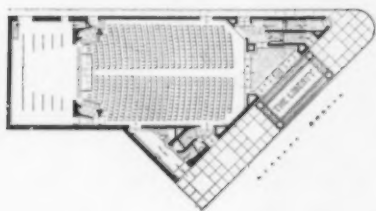
prediction that it would have jumped in this direction, and there are probably equally few who will regret it.

The street architecture in our American cities is not monotonous, whatever else can be said of it, and perhaps we have been able to develop the style here, rather than importing motives ready made for this very reason, although we all of us realize that there is far too little attention paid in the design of our American buildings to those nearby, partly because we are individualistic, not to say selfish, and partly because our structures are so impermanent, and we therefore find it unnecessary to conform our architecture to that of a building which probably will not be in existence more than a few years. Therefore what would in a European city have been aggressive daubs of color in a monotone street, are here only a little gayer and a little more cheerful than the buildings with which they are surrounded, and very appropriately express their purposes.

Colored terra cotta is so easy to obtain, so little liable to deterioration in weather conditions, lends itself so readily to interesting forms, and is above all so inexpensive, that it has succeeded where stone or plaster would have failed; and while the vast majority of our moving picture theatres have been designed by incompetent architects, these men at least have found a scheme which is successful and delightful, and if the interest in the movies continues to grow and the receipts therefor continue to demand larger and better buildings, it will not be long before we will find the best of our architects, painters, and sculptors working in collaboration to design and to color façades of permanent artistic value, and I think also that we will find them deriving the motives for these buildings, not from Classic or from Gothic art, but from the current and colloquial architecture of the movies, designed not from above downward, but which has sprung up instinctively from the efforts of humble and unappreciated men. Architecture like this, which is in a way indigenous, is bound in the end to be the most satisfactory, since in it we find the nearest thing to a complete realization of needs, and not adaptations of motives designed to express purposes completely different, and the educational value of the moving picture theatre may prove to be as great to American architecture as the movies have been in broadening the people who see them.



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THE LIBERTY THEATRE, PITTSBURGH, PA.
EDWARD B. LEE, ARCHITECT

√ The Moving Picture Theatre.

THE SIGHT LINES.
LIGHTING.

THE MACHINE BOOTH.
THE PICTURE SCREEN.

By CHARLES A. WHITTEMORE.

I. THE SIGHT LINES.

TO a layman the term "sight lines" means but little. To the theatre manager and to the architect it signifies one of the details of the construction of a successful theatre, which is the subject of much study and thought. A film may be perfect; the machines, light, and screen may be the best money can produce, and the theatre itself may be a gem of art and architecture; but if the patrons cannot get a good view of the projection the possibility of a good return on the investment is rather remote. No worse criticism of a moving picture theatre can be imagined than to have the word passed that there are only a few seats in the house where one can see the picture to advantage. People will attend grand opera or a performance given by a great actor and be satisfied with seats from which they can see only a portion of the stage so long as they can hear the voices or see part of the acting. In a picture theatre the interest is focused on a small part of the stage as compared to the area covered by the actors in a legitimate production. It is therefore vitally essential that the sight lines be so arranged that each person may have a good view of the whole screen.

It is important that vision of the audience be not confined to the screen itself. The people in the balcony, for example, should be able to see below the level of the stage so that if there is an orchestra it may be seen as well as the action of the picture. The people in the orchestra should be able to see well above the screen. These considerations are the first to be taken into account in laying out the lines.

In this discussion we are to confine ourselves to the class of theatres devoted exclusively to the projection of moving pictures and songs, but not that class of so-called picture houses which are fully equipped for the largest productions.

The factors to be considered in laying out sight lines are: relation of the first row of orchestra seats to the stage level, pitch of the orchestra floor, relation of the level of the stand-up space to the stage, distance from the curtain line to the balcony rail, rise of steppings of the balcony and the ceiling height.

The front row of seats should not be more than 3 feet below the stage level, although in some cases this distance is made 3 feet 4 inches if the auditorium is small. This arrangement enables the patrons in the front rows to sit comfortably and to see the performance without tiring the neck by continual looking up.

The pitch of the floor is limited by state and local laws. Under no conditions may the rise of an aisle towards an exit be more than 2 in 10. This determines the maximum rise at the back row of seats and from this point to the front the curve should be a form of parabolic curve. The exact nature of this curve depends on the number of rows on the floor so that it is impossible to establish an exact rule to govern all cases. The seats are usually laid out on the lines of concentric curves so that each row of seats is level for its whole length and a sight line taken in any direction gives an unobstructed view of the stage.

The level of the stand-up space is established from the relation to the street as well as from the stage. This is the most flexible level of all. In a theatre where there may be thirty rows this space is usually about 4 feet above the stage and 7 feet above the front row. From this stand-up space is determined the height of the balcony.

The distance of the balcony rail varies with the depth of the auditorium. In a deep auditorium it obviously should be farther away than where there are only a few rows. If placed farther from the curtain line than 40 feet, the results will not be so good if the balcony is deep. If placed nearer than 25 feet, the vision of the majority of those in the orchestra seats will be limited to the screen itself and the effect will be much like looking through a hole in one side of a box.

The line which establishes the rise of the steppings of the balcony is a line passing through a point 6 inches back of the rail and a point 4 feet below the stage on the curtain line. This line is made the base from which the steppings are located and is tangent to the nosings. The steppings are usually

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3 feet wide for the first and last, and 2 feet 6 inches for the intermediates. From these two factors the lines of the balcony seats may be laid out. The law limits the rise of the steppings to not more than 21 inches, many times the efficiency of the sight lines being impaired to meet this requirement without reducing the number of seats.

The distance from the floor to the soffit of the balcony is regulated by the desired sight line of the people in the last row of seats or the front of the stand-up space. A line drawn from the eye of the observer at the stand-up rail to the point on the screen, established as the limit of visibility desired, determines the limiting line of the soffit. This is not a level line if the auditorium is wide, but follows the line of the balcony rail. To find the curve of the rail it is necessary to work out the sight lines from two or three seats at the extreme ends of a few rows.

A description of the manner of determining sight lines sounds rather complex, but the simplicity of the actual process is apparent after a few cases have been worked out. It will also be readily seen how impossible it is to establish a rigid rule for the method to follow. Each theatre is a problem in itself and must be solved as such.

II. LIGHTING.

The marvelous change which has taken place in the development of the moving picture business is nowhere more strongly marked than in the lighting of the theatre. When this form of entertainment was first introduced to the public, the audience was obliged to be seated in a dark auditorium whose only illumination was the light reflected from the screen when a picture was being shown. Under such conditions the seating of the patrons was rather difficult, and to avoid accidents the ushers used small flash lamps to illuminate the aisles. Later, a system of "ushers' " lights was adopted. These were small colored lamps, installed at intervals along the walls and in certain places on the ceilings, and eliminated some of the earlier difficulties. Small lights were also placed on the standards of the seats to throw light on the aisles and the steps of the balconies. Now, however, many theatres are so well illuminated throughout the entire performance that, without diminishing the effect of the picture, one can read at any time in any part of the house. So long as no direct rays of light from the fixtures shine on the screen or in the eyes of the audience, the picture may be seen to as good advantage as if the house were completely dark. This may be accomplished by concealed lighting, indirect lighting, or by a careful placing of the fixtures so that no fixture shall come in the direct line of vision of the spectators.

In theatres where the house is "dark" the law requires that at stated intervals the lights shall be turned on to relieve the strain on the eyes and to enable the audience to be dismissed or new patrons seated without discomfort. With the new arrangement of lighting this feature is eliminated and the value of the performance increased.

The details of construction and wiring for the installation of a theatre lighting system are so complicated and technical in character that no attempt will be made to consider this side of the question, and this article will merely outline some of the important points to be considered.

There are three distinct divisions in the lighting of the theatre: the exit lights, the ushers' or emergency lights, and the general illumination. The exit lights are required by law to mark the means of egress from the auditorium. The emergency lights to furnish partial illumination in case of emergency. The general illumination, as the name implies, covers all the lights not included in the above divisions required to properly illuminate the theatre.

The exit lights are always placed over the outside doors and at certain points on stairways and in all corridors leading to an egress. They usually consist of two 16 candle power lights in an iron box with a glass "EXIT" sign placed in front, and are controlled independently of all other lights. These lights must be lighted at all times when the theatre is open for a performance.

The ushers' lights are single lights placed in a cluster on the walls and ceilings, or in a separate fixture, and are equipped with a blue or amber lamp. Like the exit lights, these are on separate feed and control from the general illumination.

The lights in the theatre are controlled from a point near the picture booth. Here the switchboard is mounted, and on it the fuses, switches, etc., are placed, so that the operator in the booth may in an instant light the whole house in case of emergency or an accident to a film. It is not sufficient to have

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the only control at this point, and an extra board is usually placed at the level of the orchestra floor, so that in case something goes wrong in the booth, the lights may be thrown on from this point.

The best type of switchboard for use in this class of theatres is the "dead front" type. On such a board there is no possibility of injury from contact with live parts. The fuses are in panels on the walls back of the board, and the only exposed parts are the switch handles and the name plates. These boards are more expensive than other types, but are fool proof.

In addition to a dual control for the exit and emergency lights it is vitally essential to have separate feeds, preferably from separate power stations. Under such conditions, if an accident should happen to one set of street mains the other will still be able to supply current, so that the theatre may be sufficiently well lighted to permit of dismissing the audience without confusion. This extra service has in many cases been the means of preventing panic and the attendant loss of life.

In the average moving picture theatre a stage equipment, such as is necessary in other theatres, is superfluous. Footlights are sometimes installed, and occasionally "strips" along the sides of the proscenium, and these usually meet all the requirements. In some theatres a strip of reflector with one or two circuits of lamps is placed on the rail around the orchestra pit and arranged to throw light on the stage when the screen is not being used for picture projection.

The outside display lighting depends on the space available and the amount of money to be invested. The best system, both from the standpoint of efficiency and economy, is what is called the "multiple series" wiring. With this system low voltage lamps are used and the current consumption is relatively small, while the light is clear white in contrast to the yellow light of the ordinary carbon filament lamp.

The character and amount of lighting, both in the theatre and in the display lighting, depend largely on special conditions to be found in each problem. There are a few essential points which must be considered even in the smallest installations, and the attempt has been made in this article to outline the fixed quantities which are common to all theatres, whether large or small.

III. THE MACHINE BOOTH.

The patrons of a moving picture theatre demand first of all a good picture. Not necessarily the picture of a special subject, but one in which the projected scenes are clear, free from excessive vibration, and with bright, even light. Without these characteristics the beauty of the subject is lost in a mass of ill defined, unnatural moving objects, whose distortion makes a grotesque of the most beautiful film. It is almost impossible to eliminate all the vibration from a picture because of the fact that the machine with which the picture is taken, and that by which it is projected, are not mounted in exactly the same manner. It is obvious that a picture taken when the machine is mounted on a moving platform will show all the vibrations of the machine itself.

The vibration due to defective or incorrect mounting of the machine has, to a large extent, been overcome by careful bracing, amounting to almost perfect rigidity, so that the criticism from this standpoint is not so frequently met as in past years.

There are a variety of makes of machines in use at the present time, the principle of which is the same, the variations being in arrangements of parts and in minor details. A good machine is the first necessity, but its mounting is of no less importance. The three things which make or mar a projection, assuming that the machine itself is perfect, are: the mounting or "setting up," the angle of projection and the character of the light.

The machine should be mounted on a floor of such construction that in itself there will be little or no vibration. A floor of masonry and steel construction is the best for this purpose. An ideal setting for the apparatus would be a standard of the same material as the floor, with adjusting screws rigidly attached to the standard and the machine base. This setting is seldom adopted because it limits the arrangement of the booth and also because of the variation in the construction of the base of different types of machines, so that a change of machine would involve many other adjustments.

In most cases the machines are mounted on telescoping legs and, when the proper adjustments have been made, strong braces with turn buckles are secured to the machine and the floor and the whole apparatus made as rigid as possible. The results obtained with this form of mounting are quite satisfactory. When the machines are set up, even in this manner on a wooden floor, care must be taken to

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avoid transmission of sound. To obviate this the legs of the base are sometimes set in sand boxes or on a cork base, and thus the sound is deadened.

When the form of base and setting has been determined, the angle of projection must be considered. Theoretically, to obtain perfect results, the machine should be mounted so that the axis of the light rays will strike the exact center of the screen. In most cases the machine can be mounted opposite the center of the screen, but in few cases is the axis of the rays at right angles to the plane of the picture. If the angle from the center of the lens to the center of the screen is more than 24 degrees, the result will be distortion in the picture varying as the angle is increased. In a theatre recently constructed the booth was placed in the rear of the balcony and to overcome the distortion the screen was tilted back at the top. The results are excellent and the slope of the screen is not apparent. A discussion of this subject would be by no means complete without reference to a device now being developed by means of which the projecting lens may always be opposite the center of the screen regardless of the position of the machine itself.

The arc light is the only form of illumination sufficiently condensed for use in picture projection. The incandescent has been tried, but has never proved successful. The character of the light employed plays as important a part in the correct projection of a picture as the setting of the machine. In most of the theatres outside the center of the large cities the current supplied is the "alternating," and this presents a special problem. The light from an alternating current arc is not so steady nor so brilliant as direct current illumination, and some type of transformer must be used to obtain the best results when alternating current is to be supplied. There are various transformers on the market, but the motor-generator and the "Compensarc" are most frequently used. The motor-generator delivers direct current to the arc, while the "Compensarc" delivers alternating current at lower voltage and lower amperage than the current from the service mains. With either of these types the heat factor is reduced to the minimum and the current consumption shows a distinct saving over the simple rheostat.

The equipment of the booth consists of a moving picture machine and a stereopticon or "dissolver." This is known as a single machine booth and differs from the two and three machine booths only in the number of moving picture machines used. There is a combination machine which has been in use for a few years in which the "dissolver" is mounted on the same base as the picture machine. This is more economical in space required and is quite as efficient from the standpoint of projection as the other type. In some of the larger theatres a "spot" or "flood" light is added to the equipment and in this way all the requirements of stage lighting from the front of the house are met.

While the construction and equipment of the booth is little known to the patrons of a moving picture theatre the fact remains that from this source most of the enjoyment is derived. Without adequate equipment in this vital part of the theatre, and if the equipment is not properly arranged, the enterprise labors toward success under a handicap which may prove fatal.

IV. THE PICTURE SCREEN.

When moving pictures first were brought to the attention of the public as a form of entertainment there were no theatres or halls adapted to this purpose, and the necessity of using the means at hand resulted in the origin of the so-called "store shows." The pictures were also added to the program of variety and vaudeville theatres. In such cases booths were erected in a space least desirable for seats, and cloth screens were hung either from the regular "rigging loft," or in the case of "store shows," from an improvised proscenium. In spite of the defects in this system of projection the interest still continued and the growth of these places of amusement was phenomenal. Managers of theatres saw with almost prophetic vision the possibility of a good investment and devoted no little thought to the improvement of the character of the surroundings of the picture. Experiments were made in the construction of the machine itself and were productive of results beyond the most optimistic expectations.

With the advent of better machines the need of a better reflecting surface was more strongly marked and investigations were made to see what could be done with this end of the picture to produce better results. To follow the various steps from the loosely hung curtain to the rigid screens of to-day would necessitate writing a complete history of the business, but such is not the intent of this article. We will consider the various forms of screens in use to-day, having in mind the fact that what now seems good may in a short time be obsolete because of the rapidity with which improvements are being made.

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There are three forms of screen in most general use at the present time. These are the cloth screen, hung like a piece of scenery, the fixed screen of cloth or a rigid surface like plaster, and the glass screen. Each is adapted to special conditions and each has certain arguments in its favor.

The cloth screen is particularly well adapted to the presentation of pictures in a regular theatre where the stage is equipped for performances of vaudeville and large variety acts. In such cases the screen is tightly stretched and attached to battens (continuous strips of wood or iron pipe) and is hung from the rigging loft in the same manner as the rest of the scenery. Guide wires or ropes are placed on the back at intervals of 3 or 4 feet and materially assist in reducing the motion of the screen. When hung in this manner the screen is readily raised to permit the whole stage to be used for other forms of entertainment. The picture shown on such a screen is good, but is not free from a certain amount of motion due to the fact that the reflecting surface is suspended, and that there are always air currents on a large stage which tend to increase the movement of the hangings. It is not possible to produce such good results under these conditions as when a fixed screen is used. In some theatres, in the endeavor to produce perfect pictures, the fixed screen construction has been used and hung from the loft. The weight of such a screen is, however, so great that only a few of them are in use.

When a fixed screen is constructed, it is usually permanent and forms the background of the stage or fills the whole of the proscenium opening. There are a variety of materials from which the screen may be built, but the best results are obtained from using hard plaster on a rigid frame of wood or metal furrings and wire lath. Great care must be taken in applying the plaster to eliminate all unevenness and streaks, as under the strong light of the arc lamp used in the projection all irregularities are magnified, and what seemed a perfect surface in ordinary light may appear quite the opposite when the picture is shown. If the surface is properly prepared, the picture presented is sharp in detail and delightfully soft in texture.

Sometimes, in order to still further improve the surface, a coating of flat enamel is applied. A glossy enamel would produce sharp definition, but would also reflect the light in such a manner as to make an uncomfortable glare.

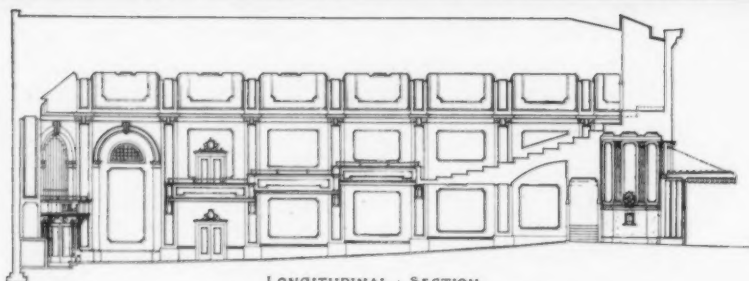
The glass screen is one of the products of the most recent study into the subject of surfaces for moving picture work. It is said to have many advantages over the other forms of screens, and many such screens have been installed. The glass is opaque and has the color of opalescent glass. It can be produced in large sheets, so a screen may be made in one piece without joints. The surface must be carefully treated to eliminate all roughness and the wavy appearance which would mar the beauty of the picture. An image thrown on such a screen has great distinctness of detail, but may also have a glare due to the high gloss of the surface.

These screens have all been considered as having flat surfaces. There is a variety of screen which has been adopted in some theatres in which the reflecting surface is curved to eliminate the distortion apparent to a person viewing the picture from an angular position. This type of screen is adapted to an extremely wide auditorium, but the best results are still obtained by using the flat screen.

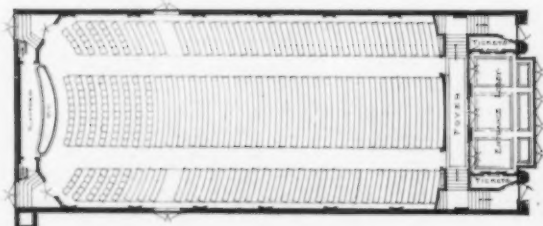
The best projection can be secured on a white screen. The picture never exactly fills the entire surface so that the portion outside of the limits of the picture must be treated in some manner to eliminate the diffusion of light from this surface. This is usually accomplished by painting a black border up to the line of the picture. The size of this border varies with the size of the screen and in some theatres the black band has been carried on the frame, that is, the ornamental moulding used to hold the picture in place. The effect of this black band is not so somber as might be expected and certainly does increase the brilliancy of the picture.

The problem of the architect in designing a moving picture theatre is more involved than it should be on account of the fact that there are no standard laws governing the construction of such buildings. Each city and state has a code of its own which varies in slight details but which make it impossible to formulate any rules which might be taken as universally true. Some cities will not allow any moving scenery on any stage unless the whole construction of the building is fireproof. Some cities will not allow border lights, footlights, nor proscenium lights unless the theater is fireproof. The only rule which can be made general for picture houses as far as the screen is concerned, is to secure the right size of picture, make the screen as rigid and smooth as possible, and then adapt the architecture and decoration to this as a unit.

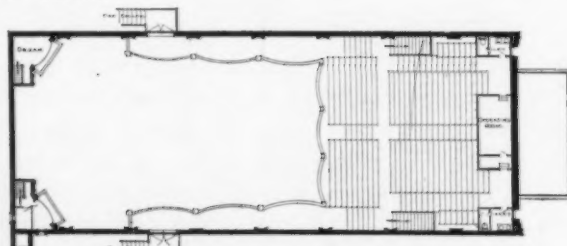
THE BRICKBUILDER.



LONGITUDINAL SECTION



ORCHESTRA FLOOR PLAN



BALCONY FLOOR PLAN

THE ORPHEUS THEATRE, CHICAGO, ILL.
ARONER & SOMERS, ARCHITECTS

New York Moving Picture Theatre Law.

A FRANK CONSIDERATION OF THE AIMS AND METHODS OF THE ORDINANCE DISCUSSED FROM THE VIEWPOINT OF THE PRACTISING ARCHITECT.

By C. H. BLACKALL.

A NEW YORK ordinance relative to moving picture houses was passed July 1, 1913. It applies only to halls seating less than 600 and in which there is no stage or scenery. Halls seating more than this number, or with stage and scenery equipment, are classed as theatres, and are subject to much more rigid provisions as to safety, fire resistance, etc. The halls seating under 600 constitute the great majority of moving picture houses in all cities, and there has been really very little attempt to regulate their construction. Whether or not the danger from such houses is more imaginary than real does not alter the fact that this ordinance intends to at least remove any official doubt as to what should be done. Some of the requirements, however, impose what seems like unnecessary burdens on owners and architects; and having in view the really slight risk, there does not seem to be any call for so rigid a prescription on the part of the licensing authorities. Six hundred people is not a very large crowd. To demand that the exits for this number shall aggregate 30 feet, with no exit less than 5 feet in width, and the main exit not less than 10 feet, is more than is required in Boston for a regular theatre of 1,800 seats, and nothing justifies the assumption that the moving picture house of 600 seats is more dangerous to life than a regular theatre in which moving pictures are given and which has a seating capacity of 1,800. Furthermore, while a gallery is permitted under the ordinance, it cannot include more than 25 per cent of the total seating capacity of the theatre. There are many cases in which with perfect safety 75 per cent of the audience could be put in a gallery which could be carried back over the entrance; but no matter how carefully such arrangement might be made, and though it might be permitted in a regular theatre which gave moving picture shows, it would be prohibited in a simple hall seating only 600.

The aisles cannot be less than 3 feet wide, irrespective of whether they serve only one row or forty. The rows of chairs must be not less than 32 inches from back to back, no matter whether the chair backs are thick or thin. Certainly this spacing is a matter of convenience and not of safety, and there is no justification with so small a seating capacity in requiring the large spacing which in most cities is the exception rather than the rule.

In the desire to be explicit, requirements as to lighting are simply absurd, referring to a standard test for reading type of a certain size at a certain distance. Nothing of this kind is ever dreamed of in a regular theatre. A very careful provision for heating even stipulates the temperature at which the hall shall be maintained. Surely this is no question of safety or health. The ordinance also goes very carefully into the amount of cubic air space for each person. A regular theatre, seating 2,000 people, might normally have no more than 100 cubic feet of space per person. This ordinance contemplates practically a minimum of 200 and under some circumstances even as high as 1,000 cubic feet of air space per person. The ordinance even comes down to prescribe when the floors shall be mopped or scrubbed and the material used therefor, and requires carpets, rugs, and other fabrics to be cleaned once daily by vacuum cleaning. In fact the whole ordinance, while in accord with what one would do under the most favorable conditions, is thoroughly absurd in that it goes much further in requirements that do not affect more safety or health than any existing laws now go for a regular theatre, whereas a regular theatre in which moving pictures are given is far more unsafe than a picture house seating under 600. It is a pity that a law should be put in force which goes out of its way to impose unnecessary burdens. Laws cannot be absolutely specific and be effectively enforced, and no amount of inspection could ever carry out all the provisions of this law, therefore it would have been much better if the law had been carefully revised by practical theatre experts before being passed; and even better yet, if the sensible course were adopted of treating all halls of audience exactly alike, whether they be mere picture houses or regular theatres. The first requisites of the law should be safety and health, and if those are properly safe guarded, other details should not be made to constitute a burden.

An Ordinance Relative to Motion Picture Theatres

FOR THE CITY OF NEW YORK.

PASSED JULY 1st, 1913.

352A.

Motion pictures shall be deemed a display on a screen or other device whereby pictures are displayed of characters or objects in motion, whether or not accompanied by music, lecture, recitation or song.

352B.

A motion picture theatre shall be deemed any public hall or room in The City of New York in which motion pictures are exhibited, in which the seating capacity does not exceed 600, and in which there is no stage or scenery.

An open air motion picture theatre shall be deemed any public place or space in the open air in The City of New York in which motion pictures are exhibited, and in which there is no stage or scenery.

The Mayor shall appoint such inspectors as shall be necessary to carry out the provisions of this ordinance. They shall be known as "Motion Picture Theatre Inspectors" and shall be paid such compensation as shall be fixed by the Board of Aldermen on recommendations of the Board of Estimate and Apportionment.

352C.

The Bureau of Licenses shall issue all motion picture licenses granted by the Mayor, and, by the authority of the Mayor, shall regulate and control all motion picture theatres, provided,

1. Applicants for motion picture theatre licenses shall file plans and specifications of the motion picture theatre with the Bureau of Buildings of the borough in which the motion picture theatre is to be situated, and must file a copy of such plans and specifications, duly approved by the Superintendent of Buildings, with the application for the license, which application shall be made to the Bureau of Licenses on blanks furnished by it for that purpose.

2. The Bureau of Licenses shall, without delay upon the request of an applicant, pass upon the location of the motion picture theatre and upon the character of the applicant requesting the license.

3. The Bureau of Licenses shall request the Fire Department, Bureau of Buildings, Department of Water Supply, Gas and Electricity, and Department of Health to inspect said theatres, and the said departments shall file in the Bureau of Licenses, within ten days, detailed written reports, which shall include a statement of any violations of law, ordinances, rules and regulations, and any dangerous conditions. Upon the failure of any of said departments (excepting the Fire Department) to file detailed written reports in reply to the request of the Bureau of Licenses, the said bureau may disregard said department and in its discretion may issue a license.

4. Until the provisions of this ordinance shall have been complied with, no license shall be issued.

352D.

1. Plans — Before the erection, construction or alteration of a building, or part thereof, to be used as a motion picture theatre, there must be filed with the Superintendent of Buildings complete plans and detailed statement as set forth in section 4 of the Building Code. The plans must show clearly and fully the location and width of all exits, passageways, stairs, fire escapes, aisles, etc.; arrangement of seats, size of floor beams, walls, supports, etc.; the location and construction of the inclosure for the motion picture light and machinery, and for other similar apparatus; a diagram of the lot or plot, showing outlets from all exits, and also such other statements, plans or details as may be required by the Superintendent of Buildings.

2. Prohibition — Motion picture theatres shall not be constructed in frame buildings within the fire limits, nor in hotels, tenement houses or lodging houses, nor in factories or workshops, except

where the theatre is separated from the rest of the building by unpierced fireproof walls and floors, and in no case shall they be constructed or operated above or below the ground floor of any building.

3. Exits and Courts — All such buildings must be provided on the main floor of the theatre with at least two separate exits, one of which shall be in the front and the other in the rear, both leading to unobstructed outlets on the street. Where the main floor of the theatre accommodates more than 300 people there shall be at least three such exits, the aggregate width in feet of such exits shall not be less than one-twentieth of the number of persons to be accommodated thereby. No exits shall be less than 5 feet in width, and there shall be a main exit not less than 10 feet in total width.

In all such buildings to be erected or to be altered so as to be used for a motion picture theatre, if unobstructed exit to a street cannot be provided at the rear of such buildings, as herein specified, either an open court or a fireproof passage or corridor must be provided from rear exit to the street front of at least the following width: 4 feet in the clear for theatres accommodating 100 persons or less; for every additional 100 persons the width to be increased 8 inches. Such passage must be constructed of fireproof material and must be at least 10 feet high in the clear. The walls forming such passage must be at least 8 inches thick, of brick or other approved fireproof material, and if there be a basement the wall on the auditorium side should either run 1 foot below the cellar bottom or may be carried in the cellar on iron columns and girders properly fireproofed according to sections 106 and 107 of the Building Code.

The ceiling of such passage, and if there be a basement, the flooring must be constructed according to section 106 of the Building Code.

If unobstructed rear exit or exits to a street are provided, the said exit or exits must be of the same total width required for the court or passage above mentioned.

Said passages and exits to the street, as above, must be used for no other purposes except for exit and entrance and must be kept free and clear.

The level of the open court or passage at the front of building shall not be greater than one step above the level of the sidewalk, and the grade shall not be more than 1 foot in 10, with no perpendicular rises.

All exit doors must be unlocked when building is open to the public. They must be fireproof and made to open outwardly and so arranged as not to obstruct the required width of exit or court when opened. All doors leading to fire escapes must be not less than 40 inches wide in the clear, and shall be located at the opposite side or end of the gallery from other exit doors.

4. Galleries and Stairs — A gallery may be permitted, but it shall not include more than 25 per cent. of the total seating capacity of the theatre. Entrance to and exit from said gallery shall in no case lead to the main floor of the theatre, and the gallery shall be provided with a stair or stairs equipped with handrails on both sides. Stairs over 7 feet wide shall be provided with centre handrail. The risers of the stairs shall not exceed $7\frac{3}{4}$ inches, and the treads, excluding nosings, shall not be less than $9\frac{1}{2}$ inches. There shall be no circular or winding staircases.

The total width of the stairs shall not be less than 8 feet in the clear where the gallery accommodates 150 people; for every 50 people less than 150 which the gallery accommodates said width may be reduced 1 foot.

Stairs shall be constructed of fireproof material, and such material and the bearing capacity of such stairs shall be approved by the Bureau of Buildings.

Galleries must also be provided with at least one line of fire escapes leading to an open court, fireproof passage or street without re-entering the same or any other building.

If the fire escape leads to a point in the court nearer the street

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than any exit, there must be a width of not less than 4 feet in the clear between the outer edge of the fire escape and the outer wall of the court.

5. Fire Escapes — All fire escapes must have balconies not less than 3 feet 4 inches in width in the clear and not less than 4 feet 6 inches long, and from said balconies there shall be staircases extending to the ground level with a rise of not over 7½ inches and a step of not less than 9½ inches, and the width of the stairs must not be less than 3 feet 4 inches.

6. Auditorium and Other Rooms — If the walls of the auditorium contain wood studs they shall be covered with either expanded metal lath or wire mesh and plastered with three coats of first class plaster, or may be covered with metal on one-half inch plaster boards. The joints shall be properly filled with mortar.

The ceilings of all such rooms shall be plastered with three coats of first class plaster on wire mesh or metal lath, or covered with one-half inch plaster boards and plastered or covered with metal.

If there be a basement or cellar, the ceiling under the auditorium floor must be plastered with three coats of first class plaster on wire mesh or expanded metal lath, or may be covered with metal on one-half inch plaster boards.

The basement or cellar under the auditorium shall be kept free and clear, except the space used for the heating apparatus, for machinery connected with the theatre and for coal.

7. Construction of Booths — Apparatus for projecting motion pictures shall be enclosed in a booth or enclosure constructed so as to be fireproof, in accordance with the specifications of chapter 756 of the Laws of 1911. The booth shall be equipped with a vent flue as prescribed in section 352C, paragraph 2, of this ordinance. Booths shall contain an approved fireproof box for the storage of films not on the projecting machine. Films shall not be stored in any other place on the premises; they shall be rewound and repaired either in the booth or in some other approved fireproof enclosure.

Where miniature motion picture machines are employed in connection with private exhibitions the requirements of the above paragraph may be so modified as to permit, instead of the regulation booth, an approved fireproof box, unventilated, and of a size only sufficient to properly enclose the machine.

8. Gradients — To overcome any difference of level in and between corridors, lobbies and aisles, gradients of not over 1 foot in 10 feet, or steps having a rise not over 8 inches and a width of not less than 10 inches must be used.

9. Aisles — All aisles in the auditorium and gallery must not be less than 3 feet wide in the clear. No aisle, passageway or space in the rear of the auditorium shall be obstructed by any camp stool, chair, sofa or settee, nor shall any person be permitted to stand or sit therein.

10. Chairs — All chairs in the auditorium except those contained in the boxes, must not be less than 32 inches from back to back and must be firmly secured to the floor. No seat in the auditorium shall have more than seven seats intervening between it and the aisle. The space occupied by each person shall be separated from the adjoining space by means of an arm or other suitable device.

11. Signs Over Exits — Over every exit there must be painted on the inside in letters not less than 6 inches high, the word "Exit" in legible type, and one red light or illuminated sign must be placed inside over each exit, and illuminated while the audience is present.

12. Floor Loads — The flooring of that portion of the building devoted to the uses or accommodation of the public must be of sufficient strength to bear safely a live load of 90 pounds per square foot.

13. Toilets — Toilets separate for sexes must be provided.

14. Fire Apparatus — Portable fire apparatus shall be provided of the following kind and number: Ten-quart capacity buckets, painted red with the word "Fire" in black, the letters 4 inches high, to the number of 6 for places seating less than 300 without a gallery, and two additional if there be a gallery; to the number of ten in places seating over 300 persons, and four additional if there be a gallery. There shall be two buckets containing dry sand kept in the operating booth; approved fire extinguishers of 2½-gallon capacity of the regulation Fire Department pattern, of which 2 shall be on the main floor and 2 in the gallery, if there be one, and 1 in the operating booth; 4 pound flat head axes, 2 of which shall be on the main floor and 2 in the gallery, if there be one.

352E.

1. Lighting — Every portion of a moving picture theatre, including exits, courts and corridors devoted to the uses or accommodation of the public, shall be so lighted by electric light during all exhibitions and until the entire audience has left the premises that a person with normal eyesight should be able to read the Snellen standard test type 40 at a distance of 20 feet and type 30 at a distance of 10 feet; normal eyesight meaning ability to read type 20 at a distance of 20 feet in daylight. Cards showing types 20, 30 and 40 shall be displayed on the side walls, together with a copy of this paragraph of the ordinance.

2. Heating — When the temperature of the outdoor air is below 60 degrees F. the air in the theatre, while an audience is present, shall be maintained at a temperature not lower than 62 degrees F. nor higher than 70 degrees F.

If gas stoves, oil stoves or other apparatus throwing off products of combustion are used to heat motion picture theatres, said products of combustion must be carried to the outside air by means of a fireproof flue or flues.

No radiator shall be placed in the aisles so as to lessen the width below the minimum requirement.

3. Ventilation — Motion picture theatres having less than 200 cubic feet of air space for each person, or motion picture theatres in which the outside window and door area is less than one-eighth of the floor area, shall be provided with artificial means of ventilation which shall supply during the time the audience is present at least 500 cubic feet of fresh air per hour for each person.

Motion picture theatres having more than 200 cubic feet of air space for each person, or which have outside windows and doors, the area of which is equal to at least one-eighth of the floor area, shall be provided with artificial means of ventilation, which shall be in operation when the outside temperature requires the windows to be kept closed, and which shall supply, during the time the audience is present, at least 500 cubic feet of fresh air per hour for each person. When the artificial ventilation is not in operation, ventilation by means of open doors and windows shall be sufficient to provide each person with 500 cubic feet of fresh air per hour.

Motion picture theatres having more than 1,000 cubic feet of air space for each person and having outside windows and doors, the area of which is equal to at least one-eighth of the total floor area, shall not be required to have artificial means of ventilation, provided the air is thoroughly changed by freely opening doors and windows immediately before the admission of the audience, and at least every 4 hours thereafter.

No part of the fresh air supply required by any of the above paragraphs of this section shall be taken from any source containing vitiated air.

The area of outside doors and windows shall mean the area capable of being freely opened to the outside air for ventilation purposes.

When fresh air is supplied by means of ventilating openings, at least one inlet shall be situated at one end of the room, and at least one outlet at the other end of the room. Where exhaust or inlet fans are necessary, at least one of such fan shall be placed in an outlet opening. The inlet opening or openings shall be placed in the floor or within 2 feet from the floor, and the outlet opening or openings in the ceiling or within 2 feet of the ceiling. The inlet openings and their surroundings shall be kept free from dust so that the incoming air shall not convey dust nor stir up dust as it enters.

During the time the audience is present, the air in the theatre shall be kept continuously in motion by means of fans to the number of at least 1 to every 150 persons. Such fans shall be placed in positions remote from the inlet and outlet openings. No person shall be exposed to any direct draft from any air inlet.

The booth in which the picture machine is operated shall be provided with an opening in its roof or upper part of its side walls, leading to the outdoor air. The vent flue shall have a minimum cross sectional area of 50 square inches and shall be fireproof. When the booth is in use, there shall be a constant current of air passing outward through said opening or vent flue, at the rate of not less than 30 cubic feet per minute.

The specifications of the above paragraph shall apply to portable booths and booths in open air theatres.

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352F.

Motion picture theatres must be kept clean and free from dust.

The floors, where covered with wood, tiles, stone, concrete, linoleum, or other washable material shall be mopped or scrubbed with water or swept with moisture or by some other dustless method at least once daily, and shall be scrubbed with water and soap, or water and some other solvent substance at least once weekly.

Carpets, rugs and other fabric floor coverings shall be cleaned at least once daily by means of suction cleaning, beating or dustless sweeping. Curtains and draperies shall be cleaned at least once monthly by suction cleaning, beating or washing. Cornices, walls and other dust-holding places shall be kept free from dust by washing or moist wiping. The wood and metal parts of all seats shall be kept clean. Fabric upholstery of seats and railings and other fixed fabrics shall be cleaned by suction cleaning, or other dustless method, at least once monthly.

352G.

Through its Motion Picture Inspectors, as provided in subsection 352b of this ordinance, the Bureau of Licenses shall inspect, subject to the authority of the Mayor, the character of exhibitions in motion picture theatres and shall report to the Mayor any offense against morality, decency or public welfare contained in said exhibitions.

352H.

All the provisions contained in this ordinance shall apply to existing places of entertainment, where motion pictures are exhibited under a common show license, in case the seating capacity be increased; and in case the seating capacity be not increased, all the provisions of this ordinance shall apply, except those of provisions of subsection 352d, designated as numbers 1, 2, 3, 4, 5 and 6, but the Bureau of Licenses shall have power in its discretion to enforce the provisions of said paragraph 3 of Section 352d as to its exits and courts.

352I.

Existing places of entertainment seating 300 persons, or less, where motion pictures are exhibited in conjunction with any other form of entertainment, must comply, before a reissuance of its license, with the provisions of section 109 of the Building Code, covering theatres seating more than 300 persons. But if such existing place of entertainment discontinue all other form of entertainment except the exhibition of motion pictures, it may be licensed in accordance with the provisions of subsection 352H.

352J.

With the exception of paragraph 7 of subsection "352D," subsections "352A" to "352F," inclusive, and subsections "352H," "352I," "352K" and "352L" of this ordinance shall not apply to motion picture exhibitions with or without charge for admission, conducted under the direct management of educational or religious institutions, nor to motion picture exhibitions without charge for admission given or held not more than once a week in private residences or bona fide social, scientific, political or athletic clubs. Before motion pictures shall be exhibited in any of the places above mentioned, there shall be obtained from the Bureau of Licenses a permit for such exhibition. Before granting such permit, the Bureau of Licenses shall cause to be inspected the premises where such proposed exhibition will be held, and shall grant the permit if in its judgment the safety of the public be properly guarded, and provided that for an audience of more than 75 people all chairs or seats shall be securely fastened to the floor or fastened together in rows.

352K.

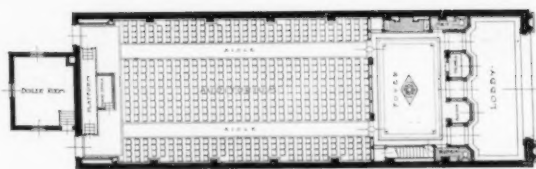
The Bureau of Licenses, at its discretion, shall specify the seating capacity for each open air motion picture theatre. Aisles must be 4 feet wide, or wider, in the discretion of the Bureau of Licenses. At least two separate exits, remote from each other, shall be provided, and no exit shall be less than 5 feet in width; for every 25 persons to be accommodated in excess of 300, the total width of exits shall be increased 1 foot. All exits must be indicated by signs and red lights, and the doors must open outwardly. Seats must be stationary, with backs 32 inches apart, and so arranged that no seat shall have more than 7 seats intervening between it and an aisle. The floor must be constructed either of wood with sleepers or concrete, and must extend at least five feet from the seats on all sides, provided, however, that in the discretion of the Bureau of Licenses, a gravel floor may be substituted for wood or concrete. Chairs must be either securely fastened to wood or concrete floor, or all chairs in a row must be fastened together, and at least 4 rows must be securely fastened to one frame, except that where refreshments are served, tables and unattached chairs or benches used with them may be permitted.

352L.

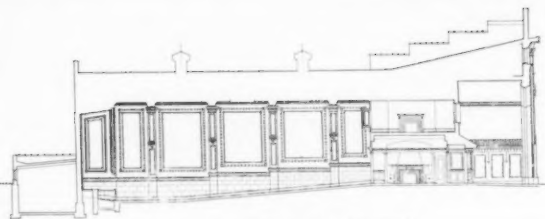
Only subsections "352A," "352B," "352C," "352D," paragraphs 7 and 13; "352G," "352J" and "352K" of this ordinance shall apply to open air motion picture theatres.



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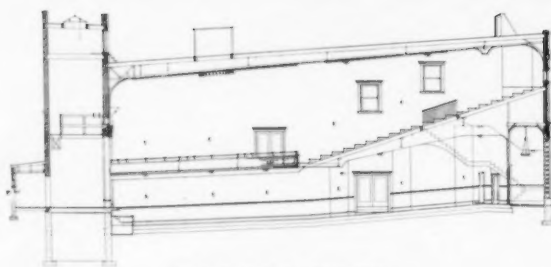
ORCHESTRA FLOOR PLAN



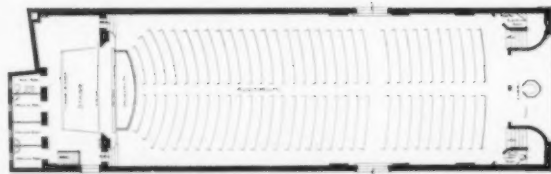
LONGITUDINAL SECTION

THE EUREKA THEATRE, PHILADELPHIA, PA.
STEARNS & CASTOR, ARCHITECTS

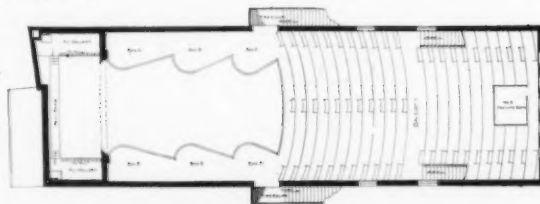
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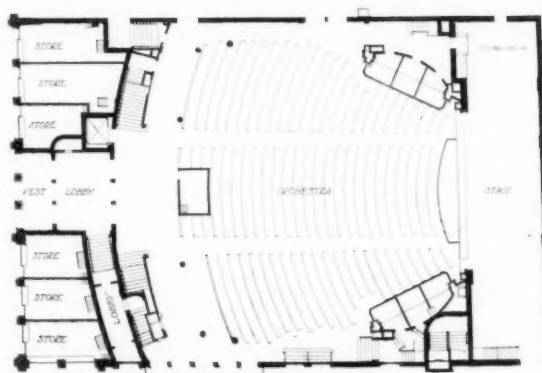
ORCHESTRA FLOOR PLAN



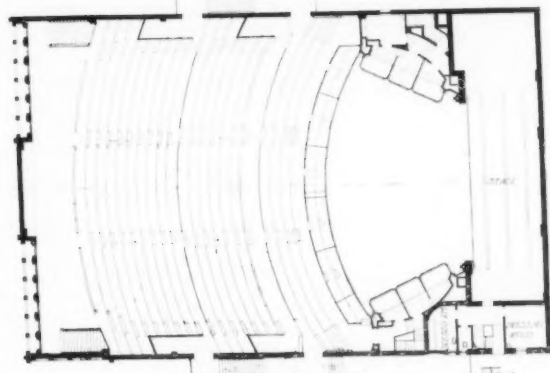
BALCONY FLOOR PLAN

PRINCESS THEATRE, HARTFORD, CONN.
L. D. BAYLEY, ARCHITECT

THE BRICKBUILDER.



ORCHESTRA FLOOR PLAN



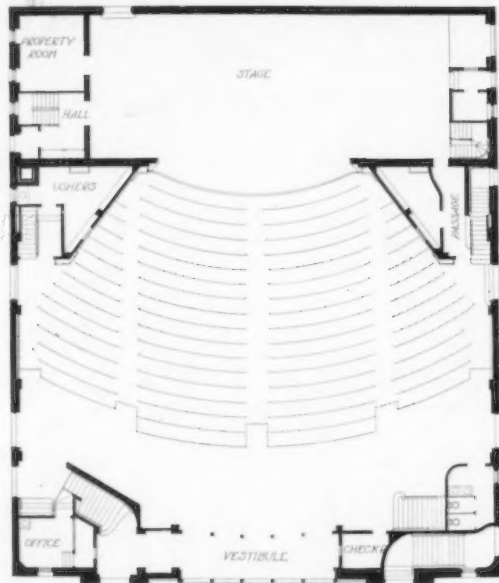
BALCONY FLOOR PLAN

REGENT THEATRE, NEW YORK
THOMAS W. LAMB, ARCHITECT

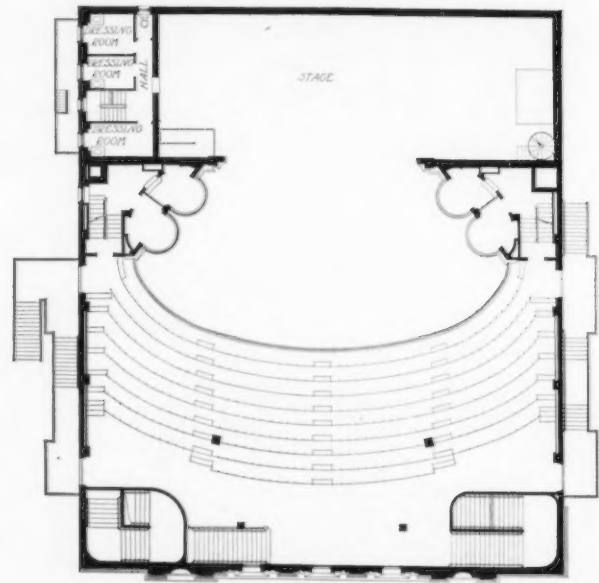
THE BRICKBUILDER.



PRINCIPAL FAÇADE



ORCHESTRA FLOOR PLAN



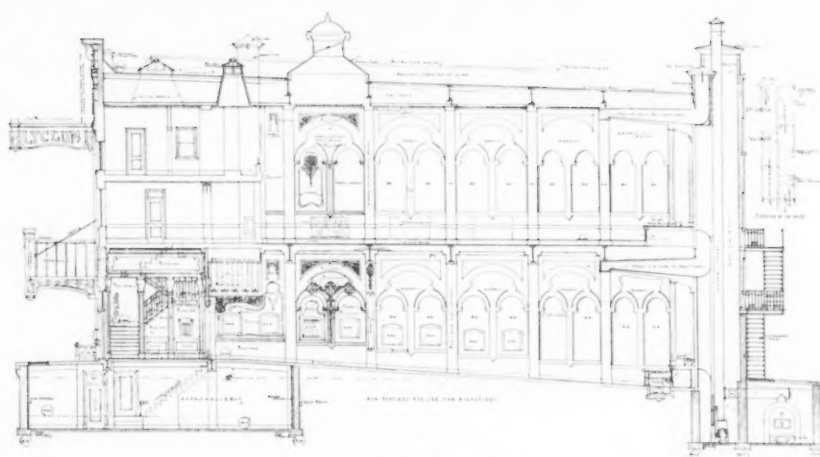
BALCONY FLOOR PLAN

MT. MORRIS THEATRE, NEW YORK
HOPPIN & KOEN, ARCHITECTS

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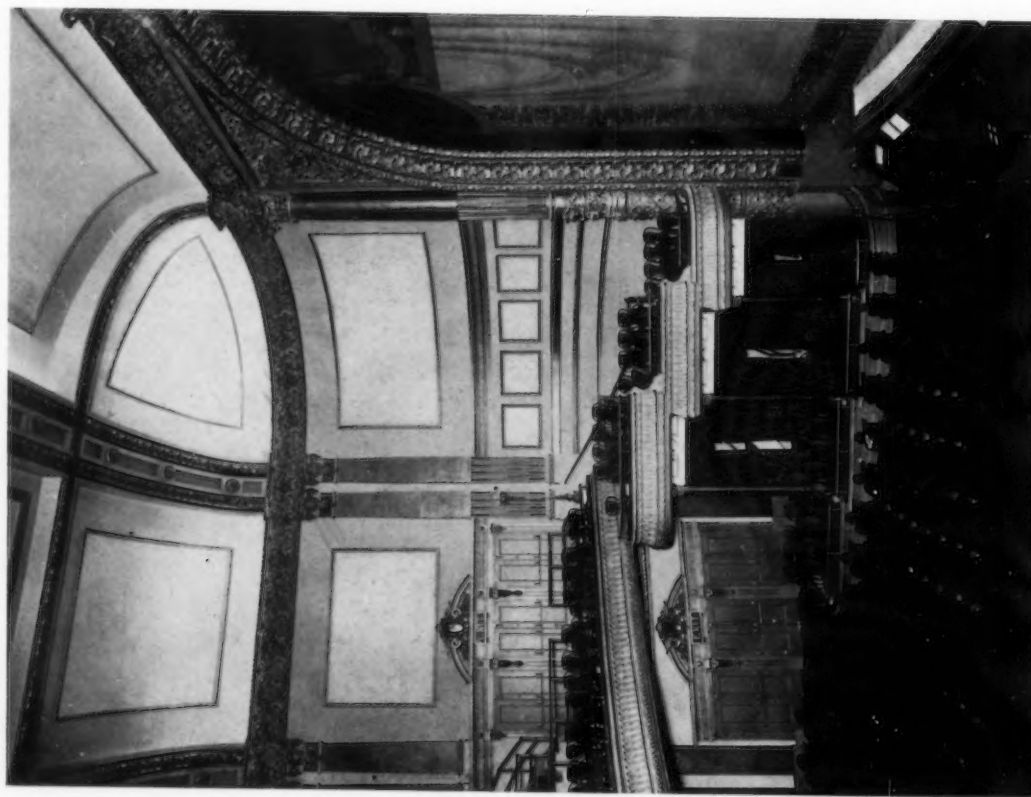
THEATRE PLAN



LONGITUDINAL SECTION

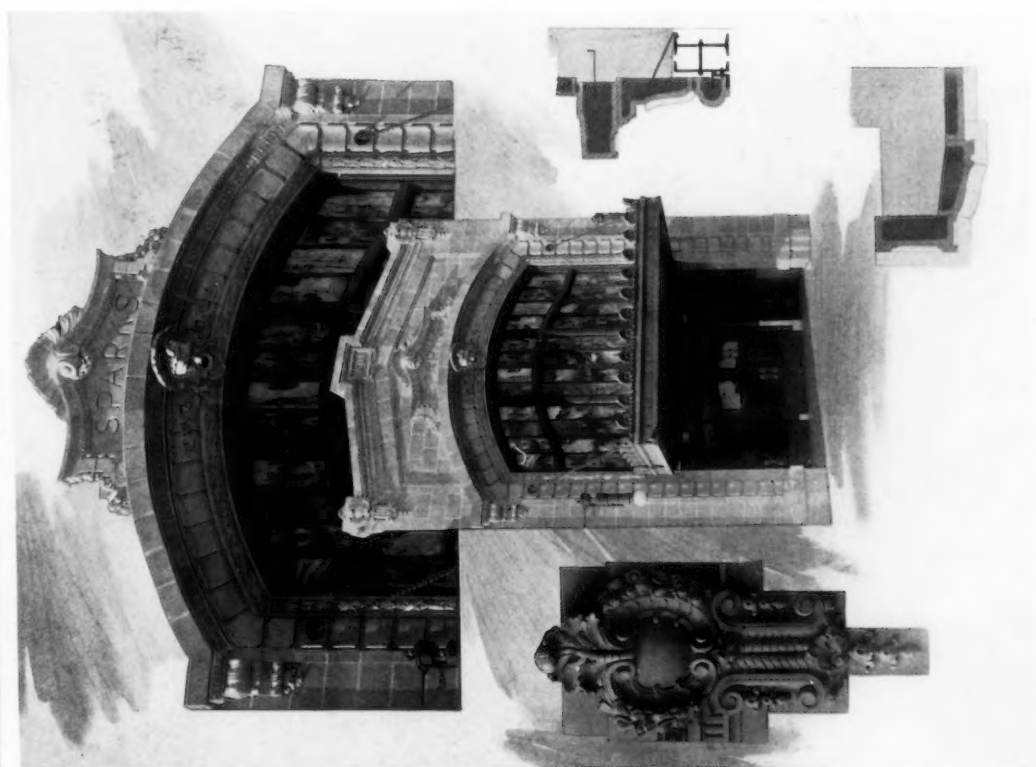
LYCEUM THEATRE AND AMUSEMENT BUILDING, NEWARK, N. J.
NATHAN MYERS, ARCHITECT

THE BRICKBUILDER.

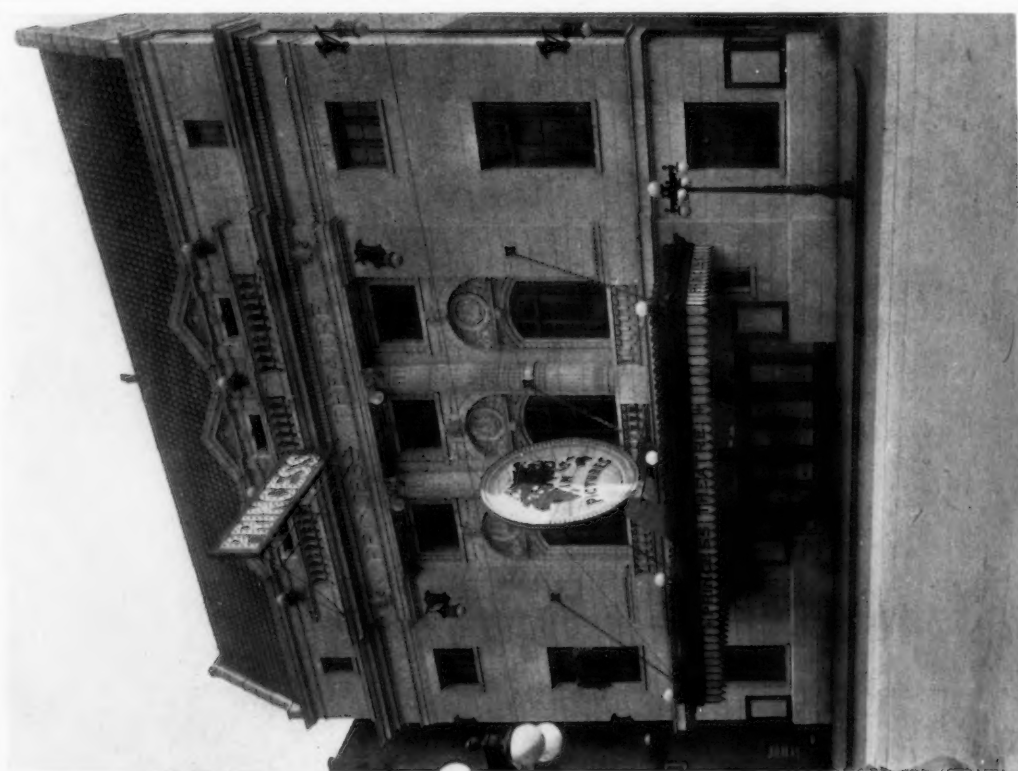


ORPHEUM THEATRE, SALT LAKE CITY, UTAH
G. ALBERT LANSBURGH, ARCHITECT

THE BRICKBUILDER.



SPARKS THEATRE, FORT SMITH, ARK.
CARL BOLLER, ARCHITECT



PRINCESS THEATRE, DES MOINES, IOWA
HALLETT & RAWSON, ARCHITECTS

THE BRICKBUILDER.



The Orpheum Theatre, Chicago, Ill.
Holabird & Roche, Architects



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